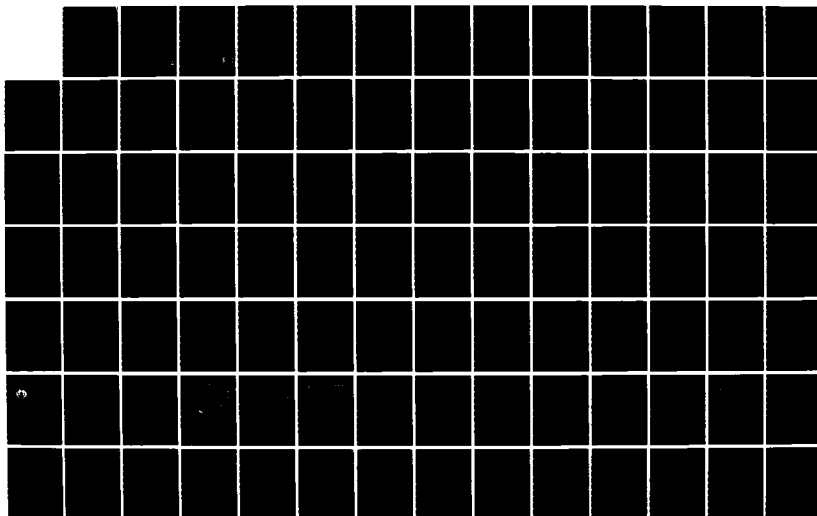
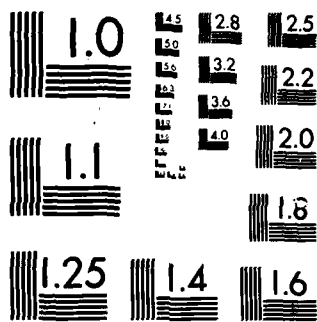


AD-A163 671 CORROSION-CONTROL (CC) PROGRAM SIMA (SHORE INTERMEDIATE 1/3
MAINTENANCE ACTIV. (U) INTEGRATED SYSTEMS ANALYSTS INC
NATIONAL CITY CA W ADKINS ET AL. 30 NOV 85
UNCLASSIFIED ISA(WC)-187-VOL-2 N66881-85-C-0350 F/G 11/6 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

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ISA(WC)-107
30 November 1985

1 AUGUST 1985 - 30 NOVEMBER 1985
FINAL REPORT

Corrosion-Control (CC) Program
SIMA Pilot CC Shop Service Test and Technical Support

Volume II
Appendices A3, A4, A6, A8

Contract N66001-85-C-0350

Prepared for:

COMMANDER
NAVAL OCEAN SYSTEMS CENTER
SAN DIEGO, CALIFORNIA 92152

In support of:

Commander, Naval Surface Force, U.S. Pacific Fleet, Code 010/N41
NAB Coronado
San Diego, California 92155

and

Commanding Officer, Shore Intermediate Maintenance Activity, San Diego
Naval Station, Box 106
San Diego, California 92136

by:

Integrated Systems Analysts, Inc.
740 Bay Boulevard
Chula Vista, California 92010

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FEB 4 1986
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AD-A163 671

DTIC FILE COPY

REPORT DOCUMENTATION PAGE		1. REPORT NO. ISA(WC)-107	2.	3. Recipient's Acquisition No. <i>AD-A163671</i>
4. Title and Subtitle Corrosion-Control (CC) Program: SIMA Pilot CC-Shop Service Test and Technical Support				5. Report Date 30 Nov 85
7. Author(s) W. Adkins, S. Kullerd, C. McPherron, M. Miller, O. O'Brien, M. Robinson, P. Schlunt, R. Sulit				8. Performing Organization Rept. No. ISA(WC)-107
9. Performing Organization Name and Address Integrated Systems Analysts, Inc. 222 West 24th Street National City, CA 92050				10. Project/Task/Work Unit No.
12. Sponsoring Organization Name and Address Naval Ocean Systems Center (Code 932) San Diego, CA 92152				11. Contract(s) or Grant(s) No. (C) N66001-85-C-0350 (G)
13. Type of Report & Period Covered Formal 1 Aug - 30 Nov 85				14.
15. Supplementary Notes <i>Vol. I, II + III</i>				
16. Abstract (Limit: 200 words) The objective of the SIMA Corrosion-Control Services Program was to develop a functional and production capability for SIMAs to deliver and support corrosion-control coating systems being used by the Navy in new construction ships and in the maintenance, repair and overhaul of ships in service. This report presents the results of the one-year Service Test of the SIMA San Diego Pilot Corrosion-Control Shop and the recommendations for establishing Corrosion-Control Production Shops at SIMAs. The one-year Service Test was completed on 30 November 1985. The establishment and operation of the Pilot Shop are summarized. For the Production Shop, recommendations are included for organization, manning, equipment, shop operation, shipboard operation, installation kits, planning and training to implement the establishment of a SIMA Production Shop.				
17. Document Analysis a. Descriptors Corrosion Paint Intermediate Maintenance Activity Aluminum Ships Corrosion Control Shop Metallizing Thermal Spray Process Instruction Powder Coating b. Identifiers/Open-Ended Terms c. COSATI Field/Group				
18. Availability Statement: For sale by the Defense Technical Information Center.		19. Security Class (This Report) Unclassified		21. No. of Pages 860
		20. Security Class (This Page) Unclassified		22. Price

This document has been approved
for public release and sale; its
distribution is unlimited.

APPENDIX A3-1

PRODUCTION SHOP EQUIPMENT

1. Degreaser	16. Small Parts Storage
2. Reach-In Blast Cabinet	17. Oxygen and Acetylene Bottle Storage Racks
3. Portable/Containerized Blast Unit	18. Work Table
4. Abrasive Blast Unit (Walk-In)	19. One-Ton Electric Hoist and Swing Boom
5. Portable/Containerized Wire-Sprayed Aluminum Unit	20. Half-Ton Hand-Operated Chain Hoist
6. WSA Spray Equipment	21. Mobile Hydraulic Floor Crane
7. Waterwash Booth	22. Hydraulic Pallet Truck
8. Paint Spray Equipment	23. Platform Truck
9. Paint Mixers	24. Zinc- and Aluminum-Identification on Steel Kit
10. Powder Spray Booth	25. Surface Profile Measurement Apparatus
11. Oven, Curing Type, Walk-In	26. Portable Electric Psychrometer
12. Powder Spray Gun/Hopper/Feeder/Control Console	27. Holiday Detector
13. Storage Cabinet	28. Wet Film Thickness Gauge
14. Flammable Liquid Storage Cabinet	29. Dry Film Thickness Gauge
15. Pre-Expanded Bins	30. Compressor and Dryer

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**DEGREASER, SOLVENT EMULSION IMMERSION TYPE (TOP-LOADING,
FIRST OPTION)**

1. **Intended Use:**

To clean and degrease objects to be grit blasted with nonflammable, water-base, biodegradable cleaning solutions.

2. **Design**

a. Immersion Basket shall have an interior dimension of 8'x4'x4', typical.

3. **Operational Requirements**

a. Load Capacity: 1000-2000 lbs.

b. Utilities

Heating

- Electric Type; 440V, 3 phase, 60 Hz, 135 amps, typical
- Gas Type; 500 SCFH, maximum
- Steam Type; 625 lbs. steam/hr @ 20 psi, maximum

Agitation

- Air Pressure; 80 psi
- Consumption; 24-48, maximum

c. Control Panel - 110V

4. **Estimated Cost**

First Alternate \$20,000

**DEGREASER, SOLVENT EMULSION IMMERSION TYPE (TOP-LOADING,
FIRST OPTION)**

1. **Intended Use:**

To clean and degrease objects to be grit blasted with nonflammable, water-base, biodegradable cleaning solutions.

2. **Design**

a. Immersion Basket shall have an interior dimension of 8'x4'x4', typical.

3. **Operational Requirements**

a. Load Capacity: 1000-2000 lbs.

b. Utilities

Heating

- Electric Type; 440V, 3 phase, 60 Hz, 135 amps, typical
- Gas Type; 500 SCFH, maximum
- Steam Type; 625 lbs. steam/hr @ 20 psi, maximum

Agitation

- Air Pressure; 80 psi
- Consumption; 24-48, maximum

c. Control Panel - 110V

4. **Estimated Cost**

First Alternate \$20,000

**DEGREASER, SOLVENT EMULSION IMMERSION TYPE (TOP-LOADING,
SECOND OPTION, PROPELLER AGITATOR)**

1. **Intended Use:**

To clean and degrease objects to be grit blasted with nonflammable, water-base, biodegradable cleaning solutions.

2. **Design**

- a. Immersion Basket shall have an interior dimension of 8'x4'x4', typical.

3. **Operational Requirements**

Utilities

a. **Heating**

- Electric Type; 440V, 3 phase, 60 Hz, 135 amp, typical
- Gas Type; 500 SCFH, typical
- Steam Type; 625 lbs. steam/hr @ 20 psi, typical

b. **Agitation**

Two each 4 HP motor shall require 440V, 3 phase, 60 Hz, 28 amps, typical

c. **Control Panel** - 110V

d. **Pneumatics** - 80 psi for tank cover (lid).

4. **Estimated Cost**

First Alternate \$30,000

VAPOR DEGREASER

1. Intended Use:

The intended use of this equipment is to remove all oil and grease from a variety of shipboard steel and aluminum components using 1,1,1-Trichloroethane.

2. Design

- Tank vapor space dimensions shall be not less than 96" long x 36" wide x 42" deep.

3. Operational Requirements

- Heating Element - 480 VAC, 3 phase, 60 Hz, 135 amps, 112.5 kW
- Pump - 480 VAC, 3 phase, 60 Hz, 5 amps, 4.6 kW

4. Estimated Cost

First Alternate \$16,000

REACH-IN BLAST CABINET WITH PRESSURE BLASTING POT

1. Intended Use:

The intended use of this system is to eject abrasive material under pressure onto various objects for removal of rust, paint, scale, etc. Daily usage will be approximately 5 hours.

2. Design:

a. Cabinet

- o Minimum working volume shall be 30"x50"x22"

3. Operational Requirements

- 480 VAC, 3 phase, 60 Hz, 4 amps, 3.33 kW
- Air - 150 CFM, 100 PSI

4. Estimated Cost

First Alternate \$9,510

ABRASIVE BLAST UNIT (WALK-IN, ANCHOR-TOOTH)

1. Intended Use:

The intended use of this system is to provide a walk-in SSPC-10 white-metal blast capability using aluminum oxide.

2. Design

a. Container

- Container exterior dimensions shall be 8'6" high x 8' wide x 20' deep.
- Roof stiffeners shall be installed as required.
- Container shall have forklift slots and crane eyes.

b. Access Doors

- Access Doors (2) to Blast Room shall each be 96"x89", hinged, lockable and weatherproof to provide a 192" x 89" access area.
- Access doors to blast room shall be located along one 20' side of the container.

c. Blast Room

- Blast Room shall be equipped with a full-floor abrasive recovery system capable of recovering 20 mesh to 80 mesh aluminum oxide.
- Walls shall be rubber lined.
- Floor grates shall be removable and have a capacity of at least 1030 psf.
- Inside dimensions shall be 6'1" high x 19' deep x 7'2" wide.
- Double-doors shall be located on one 19' side of the blast room. Each shall be 90" wide by 73" high.
- Each door shall be positive locking, both inside and outside.
- The room shall be equipped with 10 - 500 watt quartz lamps in dust-tight fixtures, flush mounted.
- All panels shall be gasketed to maintain dust-tight integrity.
- Air inlet filter frames shall be installed into the roof panels and sized to provide a minimum velocity of 500 fpm.
- Blast Room shall be provided with 2 NIOSH-approved blast helmet systems.

ABRASIVE BLAST UNIT (WALK-IN, ANCHOR-TOOTH) (Cont'd)

- Blast Room shall be equipped with a system shutoff switch.
- d. **Reclaimer**
 - Cyclone separator shall be sized for 9000 cfm minimum.
 - Separator shall reclaim 20 mesh to 80 mesh aluminum oxide.
- e. **Abrasive Conveyor Ducts**
 - Ducts shall be 100% welded construction and sized for 9000 cfm.
- f. **Dust Collector**
 - Filter area shall be 1800 sq.ft. minimum.
 - Collector shall be equipped with a 30 HP exhaust blower minimum.
- g. **Blast Machine**
 - Blast machine shall consist of 1 pressure blast pot with 14 cubic feet of sand capacity minimum.
 - Blast machines shall be equipped with remote controls to allow operators to start and stop the machine instantly.
 - Remote controls shall contain a spring-loaded metal flapper bar to prevent accidental activation.
 - Blast machine shall be equipped with an air pressure regulator with gauges.
 - Two Blast hose assemblies shall be provided.
- h. **Equipment Skid**
 - Skid shall be sized to support reclaimer, dust collector and blast machine.
 - All components shall be easily accessible.
- 3. **Operational Requirements**
 - 480 VAC, 3 phase, 60 Hz, 40 amps, 33.3 kW
 - **Air** - 200 CFM, 100 PSI
- 4. **Estimated Cost**

First Alternate	\$122,000
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CONTAINERIZED ABRASIVE-BLAST UNIT

1. Intended Use:

The intended use of this system is to provide a containerized walk-in SSPC-10 white-metal blast capability.

2. Design

- Inside dimensions shall be 6'1" high x 9'8" deep x 7'2" wide.

3. Operational Requirements

- 480 VAC, 3 phase, 60 Hz, 40 amps, 33.3 kW
- Air - 200 CFM, 100 PSI

4. Estimated Cost

First Alternate \$90,000

PORTABLE/CONTAINERIZED WIRE SPRAYED ALUMINUM UNIT

1. Intended Use:

The containerized WSA unit is to provide a portable self-contained WSA facility that can be used at a shore activity or onboard ships.

2. Design

- a. Container shall be 8'x8'x20' nominal dimensions and include WSA waterwash booth.
- b. Air quality for the air dryer shall be per DoD-STD-2138, oil and moisture free (less than .03 p/m oil). Air pressure to the control unit shall be 60 psi. minimum. No more than 35 ft 3/8" ID hose between air control unit and WSA spray gun.

3. Utility Requirements

- 480 VAC, 60 Hz, 3 phase, 60 amps

4. Estimated Cost

First Alternate \$72,500

WSA SPRAY EQUIPMENT (GUN, REGULATORS, HOSES, CONTROL PANEL, ETC.)

1. Intended Use:

Equipment is to be used to apply corrosion-resistant coatings, such as aluminum and zinc in the form of a molten metal spray developed from a metal wire using oxygen-acetylene.

2. Design

MIL-M-3800D lists items to be provided in metallizing system. The major items and the applicable MIL-SPEC paragraph are listed. Additional requirements and remarks are noted where applicable.

LIST OF EQUIPMENT

EQUIPMENT	MIL-STD PARAGRAPH	REQUIREMENTS/REMARKS
Metallizing Gun	3.4.1	Wire fed, air turbine or air motor wire device. The metallizing gun must produce high-quality coatings while operating within the 15-psi maximum allowable acetylene pressures specified by the safety codes. The gas head and cylinder valve for controlling the mixture of oxygen, air and acetylene must have "O-ring" fits for ease of PM/CM and prevention of galling and freezing from prolonged storage and use in low temperatures. <u>Add flow-rate and pressure envelope number.</u> Lubrication sight plug required for checking gear-case lubricant.
Carrying Case	3.4.8	
Manuals, parts lists, diagrams	6.2.2	Operator manuals, illustrated parts breakdown indexed to a parts/stock number list, system assembly/operating diagrams and preventive/corrective maintenance instructions.
Air Caps	3.4.1.7	Circular- and elliptical-spray patterns
Wire Nozzles	3.4.1.7	
Hose Set	3.4.2	Federal Specification ZZ-H-461
Oxygen Regulator	3.4.3	UL-252, Table III of MIL-M-3800D

WSA SPRAY EQUIPMENT (GUN, REGULATORS, HOSES, CONTROL PANEL, ETC.)
(Cont'd)

LIST OF EQUIPMENT (Cont'd)

EQUIPMENT	MIL-STD PARAGRAPH	REQUIREMENTS/REMARKS
Fuel Gas Regulator	3.4.3	UL-252, Table III of MIL-M-3800D
Oxygen Flow Meter	3.4.4	Design per MIL-M-3800
Fuel Gas Flow Meter	3.4.4	Design per MIL-M-3800
Air Flow Meter	3.4.4	Design per MIL-M-3800
Air Control Unit	3.4.5	
Wire Reel and Stand	3.4.6	Preserved with wire sprayed aluminum per DoD-STD-2138(SH)
Wire Straightener	3.4.7	
Gun Mounting Fixture	3.4.9	Not required
Flame Arrester	3.4.10	
Angular Air Caps		To produce a 45° deflection of the spray
Gun Extension		1-ft extension capable of operating with and without a 45° deflection angular air cap

3. Utility Requirements

- 30 CFM at 65 PSI
- 2.8 M³ per HR O₂
- 1.4 M³ per HR Acetylene

4. Estimated Cost

First Alternate	\$5,050
Second Alternate	\$5,127

WATERWASH BOOTH

1. Intended Use:

The water-wash spray booth is a partially enclosed structure designed to remove airborne metallic particles, dust and fumes generated by the metal spray process.

2. Design

- a. Water-wash booth working dimensions shall be nominally 20 feet long, 10 feet high, 6 feet deep.

3. Utility Requirements

- Fan - 480 VAC, 60 Hz, 3 phase, 15 amps, 12.5 kW
- Pump - 480 VAC, 60 Hz, 3 phase, 12 amps, 10 kW
- Water - 10 GPM

4. Estimated Cost

First Alternate	\$12,820
Second Alternate	\$13,852
Third Alternate	\$14,886

PAINT SPRAY EQUIPMENT

1. Intended Use:

Apply Silicon Alkyd (TT-E-490), Epoxy Polyamide (MIL-P-24441) Formula 150 and 151, Inorganic Zinc Silicate Primer (MIL-P-15929), Heat Resistant Aluminum Paint (DoD-P-24555), Zinc Chromate (TT-P-645, Wash Primer (MIL-P-15328), Conversion Coat (MIL-C-5541) and Primer (MIL-P-23377) by commercially available, lightweight, medium production, hand-held, pressure feed, compressed air paint spray gun. Intended for use within a ventilated and water-wash filter paint spray booth.

2. Design

- a. **Spray Gun** - Commercially available, lightweight, medium production, hand-held, pressure feed, compressed air paint spray gun.
- b. **Two Quart Pressure Cup** - Commercially available, two quart fluid capacity pressure cup with pressure regulating valve and pressure gage 0-160 psig range.
- c. **Air Hoses** - Commercially available, oil resistant compressed air hose. 50 foot long hose for connection from air supply to the pressure cup.
- d. **Fluid Hoses** - Commercially available, 10-foot fluid hose to connect the pressure cup to the spray gun.

3. Utility Requirements

- 15 cfm, Air at 50 PSI

4. Estimated Cost

First Alternate	\$383
Second Alternate	\$386

PAINT MIXERS

1. Intended Use:

To mix paints and primers in one (1) and five (5) gallon cans.

2. Design

- a. A one (1) gallon paint can mixer shall be designed with a 1/4 inch diameter by 10 inch long shaft with blading to mix the paint on one end. The end opposite the blading shall be used in a drill motor chuck. The drill motor will provide rotation to the mixer. Minimum rotational speed of mixer shall be 500 RPM.
- b. A five (5) gallon can mixer shall be similarly designed with a 1/2 inch diameter by 20 inch long shaft.

3. Utility Requirements

None

4. Cost

First Alternate

One (1) gallon mixer	\$6
Five (5) gallon mixer	\$31

Second Alternate

One (1) gallon mixer	\$8
Five (5) gallon mixer	\$33

POWDER SPRAY BOOTH - ESP (DRY FILTER TYPE)

1. Intended Use:

To provide a safe and nuisance-free area for the application of electrostatically-sprayed powder.

2. Design

- a. Overall work area shall be 10'x10'x10'
- b. Plenum shall have a filter bank face of 10'x10'. The plenum shall be 3'6" deep, typical.

3. Operating Requirements

- a. Face velocity at boundary of spray booth shall exceed 100 FPM when clean filters are in place. Face velocity must always be above 60 FPM.
- b. Grain loading of exhaust must not exceed 0.1 grain per cubic foot of air.
- c. Overall utility requirements:

Blower: 3 phase, 440 V, 60 Hz, 5 Amps

Lights: 110V, 60 Hz, 3.5 Amps

4. Estimated Cost

First Alternate \$4,262

Second Alternate \$5,000

ALTERNATE POWDER SPRAY BOOTH - ESP (CARTRIDGE TYPE)

1. Intended Use:

To provide a safe and nuisance-free area for the application of electrostatically-sprayed powder.

2. Design

- a. Overall work area shall be 10'x10'x10'.
- b. Plenum shall have a cartridge bank face of 10'x10'.

3. Operational Requirements

- a. Face velocity - refer to NFPA No. 33
- b. Utilities
 - Blower - 3 phase, 440V, 60 Hz, 7.5 Amps
 - Lights (total) - 110V, 60 Hz, 3.5 Amps

4. Estimated Cost

First Alternate	\$15,000-\$20,000
Second Alternate	\$15,000-\$20,000

OVEN; CURING TYPE, WALK-IN

1. Intended Use:

To provide uniform heating to parts that have to be electrostatically powder coated so that the coating will flow and cure to a smooth hard finish. The oven shall also be used for preheating parts.

2. Design

- a. Interior dimensions of oven shall be 7' high, 10' deep, 8' wide.

3. Operational Requirements

- a. Oven shall have the operational range of 100-450°F.
- b. With the 450°F limit, the oven shall be set on a concrete floor. The oven heating area will not have its own floor.
- c. Utilities:

Heat Source:

Electric Oven 3 phase, 440V, 140 KW, Maximum

Recirculation System: 3 phase, 440v, 12 Amps, Maximum

4. Estimated Cost

First Alternate

Gas Fired	\$19,000
Electric	\$19,000

Second Alternate

Gas Fired	\$22,800
Electric	\$23,800

CONTROL CONSOLE/POWER SUPPLY - ELECTROSTATIC SPRAY

1. Intended Use:

Houses all electrical and air inputs, powder feed and high voltage controls, gauges and switches for a complete single gun Electrostatic Spray System.

2. Design

- a. Chassis size, 18"x18"x10", typical
- b. Console shall be wall or cart mounted

3. Operational Requirements

a. Electrical, typical

Input	120/240 VAC, 60 Hz
Output	30-90 KV
Current (short circuit)	150 MicroAmperes

b. Pneumatic, typical

Input Air	60-100 psi
Total Air Consumption	15 SCFM

c. UC can only be used with same manufacturer's spray guns and powder hoppers

POWDER SPRAY GUN - ELECTROSTATIC SPRAY POWDER

1. Intended Use:

For the manual application of electrostatically-sprayed powder coatings.

2. Design

- a. The spray gun shall be less than 2 lbs. in weight
- b. The gun barrel shall be designed for ease of cleaning
- c. The gun shall have lance extensions of 6' and 12' for coating interior areas.

3. Operational Requirements

The gun manufacturer shall be the same for the control console and powder hopper. Interchangeability is not acceptable.

POWDER HOPPER/FEEDER - ELECTROSTATIC SPRAY POWDER

1. Intended Use:

As a portable container to hold and feed powders for the powder spray gun.

2. Design

- a. Powder capacity of 50 lb.
- b. The hopper/feeder shall be equipped with a venturi system to transfer powder to spray gun.
- c. Two additional hopper/feeders of 6-8 lb capacity shall be provided.
- d. The 6-8 lb. hopper feeders shall have a size of 35"x15"x15", typical.

3. Operational Requirements

- a. The pneumatic requirements of the hopper/feeder shall be in the ranges of:

Hopper Fluidizing Air	3-4 SCFM	5-15 psi
Ejection Air	4-6 SCFM	40-100 psi
Dilution Air	4-6 SCFM	40-100 psi

4. Estimated Cost

POWDER SPRAY SYSTEM

(Control Console/Power Supply, Spray Gun, Hopper/Feeder)

First Alternate	\$3,500
Second Alternate	\$3,700

ACCESSORIES

(Extra Hopper, Lance Extensions)

First Alternate	\$700
Second Alternate	\$700

STORAGE CABINET

1. Intended Use:

The intended use of this cabinet is to store nonflammable supplies for use in an industrial environment.

2. Design

a. Cabinet

- Exterior cabinet dimensions shall be 36" wide x 78" high x 18" deep as a minimum.

3. Utility Requirements

None

4. Estimated Cost

First Alternate \$170

Second Alternate \$227

FLAMMABLE LIQUID STORAGE CABINET

1. Intended Use:

The intended use of this cabinet is to store volatile liquids.

2. Design

a. Cabinet

- Cabinet shall be of double-wall construction.
- Cabinet shall contain vapor vent openings equipped with removable screw caps protected by flash arrester.
- Minimum 2" deep leakproof pan bottom.
- Internal Cabinet dimensions shall be 30"x18"x60" minimum.

3. Utility Requirements

None

4. Estimated Cost

First Alternate	\$462
Second Alternate	\$907

PRE-EXPENDED BIN STORAGE

1. Intended Use:

The intended use of this unit is to provide storage of fastener assemblies, classified by material and size.

2. Design

a. Shelving Unit

- Shelving shall be 36" wide x 12" deep x 75" high.

b. Bins

- Bins shall be 6" wide x 12" deep x 4" high.
- Bins shall have a handle and label holder.

3. Utility Requirements

None

4. Estimated Cost

First Alternate	\$168
Second Alternate	\$183

SMALL PARTS STORAGE

1. **Intended Use:**

The intended use of this cabinet is to store small rubber plugs and miscellaneous masking supplies.

2. **Design**

a. **Cabinet**

- Dimensions shall be at a minimum 16-1/2" deep x 35" high x 25" wide.

3. **Utility Requirements**

None

4. **Estimated Cost**

First Alternate \$229

Second Alternate \$309

OXYGEN AND ACETYLENE BOTTLE STORAGE RACKS

1. Intended Use:

To provide upright protection for high pressure gas cylinders (particularly the neck and valve assemblies) while transporting and during use.

2. Design

- a. Cabinet or rack capable of holding 4 oxygen or acetylene bottles. The racks will be constructed such that the storage rack containing bottles may be used to lift and load the bottles onto a vehicle for transportation.
- b. The cabinet shall have a door/band or bar to hold the bottles in place.
- c. A padlock hasp or locking device shall secure the bottles.
- d. The lifting eye(s) will be such that a rack with 4 bottles can be lifted using a sling onto a truck.

3. Utility Requirements

None

4. Estimated Cost

First Alternate \$450 each

Second Alternate \$450 each

WORK TABLE

1. Intended Use:

General purpose, commercially available, work table for use in Corrosion Control Shop for masking, assembly, disassembly and various repair functions.

2. Design

- a. 6'0" length x 29" width x 33-1/2" (\pm 1/2") height steel top work table supported by steel leg assembly, stringer and shelf.

3. Utility Requirements

None

4. Estimated Cost

First Alternate \$165

Second Alternate \$169

ONE-TON ELECTRIC HOIST AND SWING BOOM

1. Intended Use:

To lift heavy objects from an equipment cart, immerse and remove product from the degreaser and return to cart.

2. Design

- a. Capable of lifting and lowering 2000 pounds a height of 15 feet and moving the load along an I-Beam Trolley.
- b. Load hook shall be a swivel type and must be fitted with a safety device to bridge the throat opening. Hook throat opening shall be 29/32 inch minimum.
- c. Motor Speed Governor shall limit lowering speed to 10 feet/minute.

3. Utility Requirements

- 480 VAC, 3 phase, 60 Hz, 4 amps, 3.33 kW

4. Estimated Cost

First Alternate

Swing Boom	\$802
Hoist, Trolley & Chain Container	\$1,367
Total	\$2,169

Second Alternate

Swing Boom	Not Available
Hoist, Trolley & Chain Container	\$1,075

HALF-TON HAND-OPERATED CHAIN HOIST SUSPENDED FROM I-BEAM TROLLEY SYSTEM

1. **Intended Use:**

General equipment/heavy product/objects handling within and at the entrance to the grit and anchor-tooth blast booths.

2. **Design**

- a. 1/2 Ton capacity, hand-operated by chain, suspended from an I-Beam by a plain trolley capable of lifting 8 feet.
- b. Load Hook shall be a swivel type with a hook throat opening safety device. Hook throat opening with safety device shall not be less than 3/4 inch.

3. **Utility Requirements**

None

4. **Estimated Cost**

First Alternate \$451

Second Alternate \$500

MOBILE HYDRAULIC FLOOR CRANE (ENGINE HOIST)

1. Intended Use:

General Equipment handling.

2. Design

- a. 2000 pound capacity.
- b. Telescopic boom with a locking device to prevent boom length from changing during use.

3. Utility Requirements

None

4. Estimated Cost

First Alternate \$654

Second Alternate \$830

HYDRAULIC PALLET TRUCK

1. **Intended Use:**

General Equipment Handling

2. **Design**

a. 5000 pound capacity.

3. **Utility Requirements**

None

4. **Estimated Cost**

First Alternate \$710

Second Alternate \$772

PLATFORM TRUCK

1. **Intended Use:**

To aid in the movement of equipment, supplies, product, etc. between production work stations.

2. **Design**

1400 pound capacity, 60 inch x 30 inch hand-pushed steel platform truck/cart. Arc welded steel platform and top. Two rigid and two swivel, roller bearing, rubber wheels attached to the platform by nuts, bolts and washers. Handle is tubular steel with an offset away from projection of the platform top. Handle is removable from cart for versatility.

3. **Utility Requirements**

None

4. **Estimated Cost**

First Alternate	\$179
Second Alternate	\$186

ZINC AND ALUMINUM IDENTIFICATION ON STEEL KIT (COLOR SPOT METHOD)

1. Intended Use:

To determine if a failed metallized coating on steel is aluminum or zinc so that the proper removal technique is used.

2. Design

- a. Test papers are specially treated to dissolve a minute sample of the unknown metal when made conductive by the proper solution and electrofied by the electrical leads.
- b. The electrical leads are 9 Volt battery operated. One lead works on zinc, the other lead works on aluminum.
- c. The test for aluminum requires a black light (UV) for visible fluorescence of the indicating color spot.

3. Utility Requirements

None

4. Estimated Cost

\$125

Required (UV) Blacklight - \$55.

SURFACE PROFILE MEASUREMENT APPARATUS

1. **Intended Use:**

To provide a fast, reliable and permanent record of surface profile.

2. **Design**

- a. Profile replica tape shall form an exact reverse image of substrate profile, 0-2 mil (0-0.002") range.
- b. Spring Micrometer is used to measure profile on tape, and have a scale of 0.0001"-0.05" \pm 0.0001", typical.

3. **Utility Requirements**

None

4. **Estimated Cost**

First Alternate \$140

Second Alternate \$160

PORTABLE ELECTRIC PSYCHROMETER

1. Intended Use:

To measure relative humidity of operating environment, to ensure that WSA and ESP applications will not be in jeopardy.

2. Design

- a. Psychrometer (excluding batteries) shall weigh approximately 4 lbs. and be of the dimensions 10"x5"x2", typical.
- b. One thermometer shall be "dry bulb" type to measure temperature of ambient air and the second thermometer shall be "wet bulb" type by having its reservoir end covered in a water wetted wick, to measure the temperature of an evaporating surface.
- c. Thermometers shall be spirit filled (red liquid) and calibrated with a range of 10° to 150°F.

3. Operational Requirements

- a. Power shall be supplied by three standard flashlight batteries, Type D, typical.

4. Estimated Cost

\$175

HOLIDAY DETECTOR (PORTABLE)

1. Intended Use:

To detect voids or discontinuities in non-conductive coatings on metallic surfaces.

2. Design and Operational Requirements

- a. Size of unit shall be 10"x8"x5", typical.
- b. Weight of unit shall be 20 lb., maximum.
- c. Voltage range shall be 0-10,000 volts.
- d. Voltage shall be variably controlled and indicated on a volt meter (0-10,000 volts).
- e. Detection of holidays and pin holes shall be indicated by an audible signal, manufacturer's standard.
- f. Probe shall be manufacturer's standard band brush.

3. Utility Requirements

None

4. Estimated Cost

First Alternate	\$2,200
Second Alternate	\$2,200
Rechargeable Battery Pack	\$585
Regular Battery Pack	\$135

WET FILM THICKNESS GAUGE

1. Intended Use:

To measure thickness of wet paint to insure that the proper amount and technique is being used.

2. Design

a. Pocket size, 4"x1.5", typical

b. Square type

3. Operational Requirements

a. Capable of measurements from 0-20 mils ± 1 mil (0-0.02" ± 0.001 ").

4. Estimated Cost

First Alternate \$21

Second Alternate \$19

DRY FILM THICKNESS GAUGES

1. Intended Use:

To measure the thickness of paint and/or WSA on steel; and the thickness of electrostatic spray powder coatings on steel or aluminum.

2. Design

- a. Pen size (6" long, 0.5" diameter) gauges shall be designed for measurement of non-magnetic coatings on mild steel substrates.
- b. Digital gauges shall be eddy-current type, designed for measuring non-conductive coatings on ferrous and non-ferrous substrates.
- c. Digital gauges shall be battery operated (Batteries, 6x1.5V AA, typical) and small in size (9"x4"x2", typical).
- d. The digital gauges shall have a memory for at least 100 readings. It shall also have printer compatability.
- e. Printer shall provide hard copy of readings.
Size: 12"x12"x4", typical.
- f. Pen size gauges shall have an accuracy of at least $\pm 15\%$ full scale.
- g. Digital gauges shall have an accuracy of at least $\pm 3\%$ full scale.

3. Utility Requirements

None

4. Estimated Cost

Pen Size Pull-Off Gauge

First Alternate	\$135
Second Alternate	\$140

Digital Gauge for Ferrous/Non-Ferrous Substrates

First Alternate	\$1,895
Second Alternate	\$1,995

Printer for Digital Gauge

First Alternate	\$260
Second Alternate	\$260

AIR COMPRESSOR AND DRYER

1. Intended Use:

To supply compressed air of breathing quality for use in strip and anchor-tooth blasters, powder and paint spray booths and shop support air.

2. Design

- a. 800 CFM 125 psig Rotary Screw Air Compressor.
- b. Skid-Mounted, Sound Attenuation Enclosure.
- c. Water Cooled, Built-in Aftercooler.

3. Utility Requirements

- 450 VAC, 3 phase, 60 Hz, 350 amps, 292 kW

4. Estimated Cost

First Alternate

Compressor	\$30,000
Dryer	\$ 7,800
Total	\$37,800

Second Alternate

Compressor	\$32,000
Dryer	\$17,000
Total	\$49,000

APPENDIX A4-1

SIMA(SD) WSA- and ESP-PRESERVATION PRODUCTION SUMMARY

1.0 INTRODUCTION

In order to maintain a detailed listing of components preserved by the CC Shop, all records in the shop were summarized to complete a listing of all WSA-coated components. The ESP-summary was derived from the powder-coating application contractor's invoices.

2.0 WSA-PRODUCTION SUMMARY

The records maintained by the Pilot CC Shop through 19 September 1985 were removed from the files, organized by ship in chronological order by WSA date and refiled in the shop. Table A4-1-1 is a summary of all Production-Control Records of the Pilot CC Shop in addition to those transferred from Shop 31M. The components are specified along with their Job Sequence Number (JSN), WSA date and location where indicated.

3.0 ESP-PRODUCTION SUMMARY

The application contractor's invoices were the data bank that the ESP summary (Table A4-1-2) was created from. The Pilot CC Shop did not maintain complete powder-coating records due to the limited involvement required of the shop. Records will, however, be maintained for components powder coated by the Pilot CC Shop in the newly-installed ESP facility. These preserved components will be reported at a later date in the Pilot Powder-Coating Facility Report.

Table A4-1-1 WSA-PRODUCTION SUMMARY
(19 September 1985 - Cutoff Date)

JSN	COMPONENT	QUANTITY	WSA DATE
ALAMO (LSD-33)			
Q204	HP Drain Globe Valve	1	12 Aug 83
—	1/4" Globe Valve	1	2 Apr 85
—	1/4" Globe Valve	1	2 Apr 85
Q339	1/4" Globe Valve	1	2 Apr 85
Q113	1/2" Globe Valve	1	2 Apr 85
QA73	3/4" #2 Superheater Globe Valve	9	3 Apr 85
Q329	Desuperheater Sample Cooler Valve	3	10 Apr 85
ALBERT DAVID (FF-1050)			
9789	Non-Watertight Door (1-49-1/2)	2	10 Oct 84
9790	Ladder Stanchion	7	10-11 Oct 84
9791	Wishbone Accommodation (1-93-2)	1	11 Oct 84
9774	Stanchion Support	13	25 Oct 84
9767	Hawse Pipe Cover	1	26 Oct 84
9767	Emergency Tiller	1	7 Dec 84
9798	Portable Davit	2	14 Dec 84
9544	Portable Davit Support W/Cap	1	26 Dec 84
9798	Portable Davit Support Cap	1	5 Feb 85
ANCHORAGE			
Q980	1/4" Globe Valve	2	1 Jul 83
Q967	3/4" Superheater Globe Valve	3	22 Jul 83
1866	Steam Adm. Valve	1	22 Jul 83
2052	Valve, Governor System	1	28 Jul 83
BAGLEY (FF-1069)			
Q962	Auxiliary Steam Bypass Valve	1	19 May 83
Q004	Valve	1	28 Mar 85
Q000	Bypass Valve	1	29 Mar 85
Q003	Valve	1	29 Mar 85
BARBEY (FF-1088)			
0991	Engine Manifold/Intake/Elbow	1	21 Mar 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
BERKELEY (DDG-15)			
1691	8" Aux. Exhaust Relief Valve (5-63-0-E)	1	7 Dec 84
3269	Gland Seal Regulator (5-127-0-E)	1	10 Dec 84
1516	3" LP Steam Regulating Valve (#1 Dist. Unit)	1	10 Dec 84
0803	WT Hatch (1-163-2, 1-163-1, 1-107-2, 1-63-1, 1-136-2, 1-113-1, 1-63-2, 03-128-0, 1-48-1, 1-47-2, 1-70-2, 1-16-0, 01-86-2)	13	10-28 Dec 84
A706	3" Exhaust Relief Valve (5-73-0-E)	1	14 Dec 84
1706	#1A Exhaust Relief Valve (5-63-0-E)	1	14 Dec 84
3280	Valve	1	14 Dec 84
—	50 Cal. Gun Mount	4	14 Dec 84
0812	Line Reel	4	14-16 Dec 84
3287	#2A Condensate Pump Valve (5-127-0-E)	2	14-17 Dec 84
A700	8" Exhaust Relief Valve (5-63-0-E)	1	17 Dec 84
1700	8" #1A MFP Exh. Relief Valve (5-63-0-E)	1	17 Dec 84
3282	6" #2 Pump Mn. Circ. Valve (5-127-0-E)	1	17 Dec 84
0814	Baxter Bolt	7	17 Dec 85
2865/6	Director Counterweight	12	17-18 Dec 84
—	Portable Davit (1-40-1/2)	2	17-18 Dec 84
C700	Exhaust Relief Valve (5-63-0-E)	1	19 Dec 84
0805	Hawse Pipe Cover (1-8-1/2)	2	20 Dec 84
0804	Turtleback (1-20-0)	2	26 Dec 84
—	Stanchion	12	28-31 Dec 84
—	FAS Station	1	4 Jan 85
0803	WT Door (01-87-1, 01-125-1)	2	11 Jan 85
2863	Hatch (01-68-1, 02-134-2)	1	11 Jan 85
0809	Weathertight Door (1-47-2)	1	11 Jan 85
0815	WT Hatch (1-192-2, 1-35-2, 01-150-2)	3	11 Jan 85
—	Gun Mount Shield	2	11-14 Jan 85
—	FAS Swivel Arm Assembly	4	14 Jan 85
0803	Door Latch	2	14 Jan 85
1463	1" Reducing Valve (3-83-0-E)	1	10 Apr 85
0381	Big Eyes Mount (03-63-0-C)	4	17-19 Jul 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
BRADLEY (FF-1041)			
Q575	Supercharger Drain Valve	1	3 Jun 83
BRONSTEIN (FF-1035)			
Q981	#1A Boiler Bleeder Valve	1	2 Jun 83
Q982	Boiler Steam Drum Valve	1	2 Jun 83
Q976	4-1/2" Globe Valve	1	28 Jun 83
BUCHANAN (DDG-14)			
Q268	2-1/2" Globe Valve	1	21 Oct 83
Q083	3/4" Globe Valve	1	28 Oct 83
2327	2" Throttle Valve	1	16 Mar 84
CAYUGA (LST-1186)			
0828	Lube Oil Valve	1	12 Sep 83
1524	Lube Oil Valve	1	12 Sep 83
0825	Lube Oil Valve	1	12 Sep 83
CLEVELAND (LPD-7)			
1909	LP Drain Valve	1	1 Aug 83
1910	1/2" Globe Valve	2	1 Aug 83
Q825	Soot Blower	1	23 Aug 83
0729	Steam Drain Valve	1	30 Aug 83
QP28	LP Drain Valve	4	29 Oct 83
CNSP			
4174	Exhaust Manifold	1	1 Aug 83
—	Manifold	2	10 Jul 85
0025	Elbow	1	20 Aug 85
COOK (FF-1083)			
Q193	Soot Blower Root Valve	1	23 Feb 84

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
COPELAND (FFG-25)			
0289	Chock Cover	6	8-25 Feb 85
0283	Strainer Handle	5	19 Feb 85
0284	Scupper Bracket	16	19-25 Feb 85
0284	Anchor Stopper Wrench	1	25 Feb 85
0285	FAS Swivel	4	25 Feb 85
0290	FAS Swivel Arm Assembly	2	25 Feb 85
0287	Hawse Pipe Cover	1	25 Feb 85
0323	50 Cal. Gun Mount	4	25-26 Feb 85
0300	Big Eyes Mount	2	25-26 Feb 85
0317	Bottle Bracket W/J-Bolts	3	25 Feb-8 Mar 85
—	Outrigger	3	26 Feb 85
—	Bullnose Screen	1	26 Feb 85
0286	Chain Locker Cover	1	26 Feb 85
0293	Accommodation Ladder Bracket	2	27 Feb 85
0136	Searchlight Yoke	2	8 Mar 85
0311	Boat Brace	2	11 Mar 85
0316	Pipe Bracket	14	11 Mar-2 Apr 85
0314	Waste Oil Drum Bracket	4	13 Mar 85
—	Handwheel	1	20 Mar 85
—	Marine Strainer Handle	3	20-29 Mar 85
0325	Light Bracket	19	20-29 Mar 85
0304	Hatch	1	2 Apr 85
DENVER (LPD-9)			
Q117	3/4" Globe Valve	2	8 Nov 83
4305	5" #2A Exh. Relief Valve (7-160-0-E)	1	25 Feb 85
4306	#2B Exh. Relief Valve (7-160-0-E)	1	25 Feb 85
5194	3/4" #1A FOSP Constant Pressure Valve	1	14 May 85
5198	Valve	1	24 May 85
5199	5" #1 Feedback Exhaust Relief Valve	1	24 May 85
5229	3" #1B Reducer	1	19 Jul 85
DUBUQUE (LPD-8)			
1826	Steam Admin. Valve	1	22 Jul 83
Q747	Steam Blanket Guarding Valve (7-160-0)	1	17 May 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
DULUTH (LPD-6)			
Q387	#2 Feedback LP Drain Valve	1	16 Jan 84
Q278	#1A Main Feed Pump Root Valve	1	16 Jan 84
Q391	#2B MFP Drain Globe Valve	2	16 Jan 84
Q386	3/4" HP Drain Globe Valve	1	16 Jan 84
Q203	1/2" LP Drain Globe Valve	1	16 Jan 84
Q344	1/2" Steam Globe Valve	2	17 Jan 84
Q487	1/2" LP Drain Globe Valve	1	17 Jan 84
Q393	#2A F.O.S.P. Drain Valve	1	17 Jan 84
Q396	3/4" Boiler Drain Valve	2	9 Feb 84
Q430	1/4" Gauge Cutout Globe Valve	2	9 Feb 84
Q756	3/4" #1 Main Circ. Globe Valve	1	9 Feb 84
Q202	3/4" HP Drain Globe Valve	2	9 Feb 84
DURHAM (LKA-114)			
2054	L.O. Temperature Regulating Valve	1	9 Sep 83
2307	Auxiliary Steam Reducing Valve	1	9 Sep 83
2136	2-1/2" Steam Valve	1	9 Sep 83
2306	3" Steam Valve	1	14 Sep 83
2586	3"x3-1/2" #2 Throttle Trip Valve	1	29 Jan 85
2357	6" Relief Valve	1	30 Jan 85
Q229	4"x2" #1A Feed Check Valve (5-77-0-E)	1	24 Jun 85
ELLIOT (DD-967)			
0094	F.O. Service	1	2 Mar 84
EE02	Floodlights		21 Mar 84
2684	M/W Boat Engine Manifold	1	11 Mar 85
ENGLAND (CG-22)			
Q733	1/2" Auxiliary Steam Globe Valve	1	20 May 83
1639	Steam Yoke	1	5 Jul 83
Q900	1/2" Main Drain Globe Valve	1	8 Jul 83
A734	Main Feed Pump Turbine	1	21 Jul 83
Q658	1-1/2" Globe Valve	1	25 Jul 83
Q159	1-1/2" Stop Check Valve	1	4 Apr 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
FIFE (DD-991)			
1013	WHB Manual Steam Step Valve	1	14 Jun 83
1014	4" Main Steam Gate Valve	1	15 Jun 83
1029	3" Steam Regulating Valve	1	15 Jun 83
1012	Fuel Gate Valve	1	15 Jun 83
0832	1-1/2" Relief Valve	1	17 Jun 83
0688	4" Steam Regulating Valve	1	17 Jun 83
0822	1-1/2" Relief Valve	1	17 Jun 83
0894	3" L.O. Regulating Valve	1	17 Jun 83
0811	2" Safety Relief Valve	1	21 Jun 83
0810	2" Safety Relief Valve	1	21 Jun 83
1044	Valve	1	15 Mar 84
FLETCHER (DD-992)			
0549	Chain Bar	2	15 Jan 85
0549	Anchor Wrench	2	16 Jan 85
0566	FAS Piping	4	17 Jan 85
0568	Light Bracket	34	23-25 Jan 85
0570	Scuttle	3	23-28 Jan 85
0570	Hatch	8	25 Jan 85
0563	Turtleback	2	24 Jan 85
1093	Butterfly Valve Plate Stoppers	14	25 Jan 85
0551	FAS Swivel Arm Assembly	4	25-28 Jan 85
—	50 Cal. Shield	2	28 Jan 85
0559	Pipe Brackets	114	28 Jan 85
0560	Stanchion	24	28 Jan-5 Feb 85
0548	P-250 Base (01-280-2)	2	5 Feb 85
0562	NATO Fitting	8	5 Feb 85
1163	Doorsill	5	5 Feb 85
—	50 Cal. Gun Mount	2	8 Feb 85
FORT FISHER (LSD-40)			
Q310	3/4" Valve	4	12 Apr 83
Q317	LP FOSP Drain Valves	2	12 Apr 83
Q423	F/F Pump Root Valve	1	28 Apr 83
1085	Air Ejector Drain Valve	2	28 Apr 83
A319	2" MFP Regulating Valve	1	2 May 83
8080	Diesel Generator	1	26 May 83
0349	1/2" Regulating Valve	1	26 May 83
0757	1/2" Regulating Valve	1	26 May 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
FORT FISHER (LSD-40) (Cont'd)			
0325	Emergency Feed Pump Valve	1	26 May 83
Q728	1-1/2" Feed Pump Globe Valve	1	7 Jun 83
Q285	1/2" Chemical Injection Globe Valve	1	14 Jul 83
Q816	1-1/2" Globe Valve	1	6 Sep 83
8284	Water Manifold	1	14 Dec 84
8284	Exhaust Manifold	1	14 Dec 84
Q088	#1A Main Feed Pump Valve (5-109-0-E)	1	27 Jun 85
FOX (CG-33)			
—	Valve	1	24 Jun 85
FRESNO (LST-1182)			
—	Stopper Roller	22	2 Oct 84
—	Stopper	22	2 Oct 84
—	Stanchion	19	2 Oct 84
—	Strongback	2	3 Oct 84
—	Chain	2	3 Oct 84
1777	Debark Stanchion	9	16 Oct 84
1776	Cleat	7	24 Oct 84
—	Debark Handrail	10	25 Oct 84
1589	Dog	13	26 Oct 84
1592	Vent Screen Cover	8	26 Oct 84
1588	Stanchion	9	26-30 Oct 84
1782	Stanchion	61	30 Oct-10 Dec 84
1588	Hawse Pipe Cover	2	30 Oct 84
2782	Stanchion	34	8 Feb 85
3458	Engine Manifold (1-129)	1	11 Mar 85
—	Fairlead Pad	2	26 Mar 85
GOMPERS (AD-37)			
3172	Emergency Feed Pump Steam Valve	1	25 May 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
GRIDLEY (CG-21)			
3713	3-1/2" #2 Gland Seal Regulating Valve (5-136-0-E)	1	1 Aug 85
3802	F/O Unloading Valve	1	12 Aug 85
3760	2" Steam Admission Valve	1	21 Aug 85
HALSEY (CG-23)			
Q711	1/2" Auxiliary Steam Globe Valve	3	21 Sep 83
Q193	3/4" Steam Globe Valve	1	6 Oct 83
Q745	Main Steam Valve	3	12 Oct 83
Q199	1/4" F/O Supply Globe Valve	6	14 Oct 83
Q747	Main Steam Drain Valve	3	14 Oct 83
Q746	1/4" Main Steam Globe Valve	2	14 Oct 83
QA99	1/4" F.O. Globe Valve	6	14 Oct 83
Q719	1/2" FW Drain Globe Valve	2	29 Oct 83
Q750	1/2" FW Drain Globe Valve	3	30 Dec 83
A321	1/2" #2B FOSP Governor Valve (5-116-0-E)	1	25 Feb 85
Z007	6" Combo Exhaust/Relief Valve (5-116-0-E)	1	28 Feb 85
Z008	6" Combo Exhaust/Relief Valve (5-116-0-E)	2	28 Feb 85
Z006	6" Combo Exhaust/Relief Valve (5-116-0-E)	1	28 Feb-1 Mar 85
3005	6" Combo Exhaust/Relief Valve (5-116-0-E)	2	1 Mar 85
0916	#1 Diesel Engine Manifold	1	11 Mar 85
1321	1/2" #2A FOSP Governor Valve	1	11 Mar 85
0771	Main Steam Turbine Valve	1	20 Mar 85
Q789	Valve (1-3", 2-1/4")	3	4 Apr 85
Q784	Valve	1	11 Apr 85
HENRY B. WILSON (DDG-7)			
Q433	Steam Valve	1	9 Jan 84
Q440	1/4" Sample Cut-out Valve	1	9 Feb 84
Q446	1/4" Sample Cut-out Valve	1	9 Feb 84
2705	Marrotta Valve (5-63-0)	1	18 Jan 85
3038	Searchlight Yoke	5	23 Jan-8 Mar 85
0744	3" #2A Boiler Feed Check Valve (5-107-0-E)	1	23 Jan 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
HEPBURN (FF-1055)			
1460	Auxiliary Exhaust Steam Root Valve	1	1 Jun 83
1251	1" Relief Valve	1	21 Jun 83
2122	Bilge Stripping Pump Valve	1	12 Jul 83
Q363	1/4" Feedwater Globe Valve	1	28 Sep 83
Q364	1/4" Feedwater Globe Valve	1	28 Sep 83
Q319	Steam Blanket Valve	1	3 Oct 83
Q318	Steam Valve	1	3 Oct 83
Q361	2-1/2" Main Steam Globe Valve	1	17 Oct 83
Q351	1/2" Auxiliary Steam Globe Valve	3	17 Oct 83
Q354	1/2" Steam Valve	2	11 Nov 83
1737	Engine Manifold/Exhaust/Intake	1	11 Mar 85
HILL (DD-986)			
1250	Steam Supply Cut-out Valve (5-300-0-E)	1	17 Oct 84
1001	Valve	1	13 Nov 84
HOEL (DDG-13)			
1315	1-1/2" Steam Relief Valve	1	2 Jun 83
HORNE (CG-30)			
Q998	2" Main Circulating Pump Valve	1	1 Jun 83
A923	#1 BSSTG Globe Valve	1	2 Jun 83
3882	1/2" Regulating Valve	1	3 Jun 83
A864	Main Steam Drain Valve	1	3 Jun 83
Q992	SSTG Throttle Drain Valve	2	7 Jun 83
Q906	1/4" Main Feed Globe Valve	1	9 Jun 83
Q936	1-1/2" Relief Valve	1	13 Jun 83
Q957	1/2" Globe Valve	3	13 Jun 83
A936	1-1/2" Relief Valve	1	13 Jun 83
Q542	1/2" Globe Valve	3	14 Jun 83
Q864	Main Steam Drain Valve	1	14 Jun 83
Q865	1/2" Main Steam Globe Valve	1	14 Jun 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
JOUETT (CG-29)			
Q300	1st Stage Steam Cut-out Valve	1	7 Jun 83
Q646	1/2" Globe Valve	2	25 Jul 83
Q700	1/4" Main Steam Globe Valve	2	28 Jul 83
Q300	1/2" Steam Globe Valve	1	26 Aug 83
Q934	Main Steam Bypass Valve	1	29 Aug 83
Q034	HP Main Steam Valve	1	19 Oct 83
Q847	Boiler Drain Valve	1	21 Oct 83
4216	6"x4" Combo Exhaust/Relief Valve (5-72-0-E)	1	16 Jan 85
Q341	5" #2A Main Feed Stop Valve (5-116-0-E)	1	1 Feb 85
Z003	1-1/2" #2A Reducing Valve (Fireroom #2)	1	1 Mar 85
Q341	5" Main Feed Stop Gate Valve (5-116-0)	2	29 Mar 85
0912	#1 OMB Engine Manifold	5	8 May 85
JUNEAU (LPD-12)			
Q157	1/4" Auxiliary Steam Drain Valve	2	30 Dec 83
Q804	3/4" #1B FOSP Aux. Steam Drain Valve	2	30 Dec 83
Q129	Auxiliary Steam Drain Valve	2	30 Dec 83
Q803	Steam Valve	1	9 Jan 84
—	#2A FOSP Drain Valve	1	16 Jan 84
Q150	1/2" Steam Globe Valve	2	17 Jan 84
Q806	3/4" Steam Globe Valve	2	17 Jan 84
Q179	#2A FOSP HP Drain Valve	1	17 Jan 84
1098	Globe Valve	1	3 Feb 84
Q139	3/4" Superheater Globe Valve	2	14 Feb 84
Q794	3/4" Superheater Drain Globe Valve	1	14 Feb 84
Q794	1/2" Superheater Drain Globe Valve	2	
Q795	3/4" Superheater Drain Globe Valve	2	14 Feb 84
Q148	1/2" FO Drain Globe Valve	2	15 Feb 84
Q805	3/4" Mainfeed Drain Globe Valve	2	15 Feb 84
0468	Engine Manifold	1	3 Oct 84
A660	Electrical Box	1	19 Jul 85
0660	Electrical Box	2	24 Jul 85
A394	4" Diaphragm Valve (7-160-0-E)	1	24 Jul 85
2440	Valve	1	30 Aug 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
KINKAID (DD-965)			
1130	4" Steam Dump Valve (5-174-0-E)	1	20 Mar 85
KITTY HAWK (CV-63)			
Q809	1/2" Main Steam Globe Valve	1	1 Sep 83
Q259	LP Steam Drain Valve	1	6 Dec 83
A940	Inlet Reducer	1	5 Nov 84
0457	Air Escape Flanged Terminal W/Check Valve	5	21 Mar 85
L. MCCORMICK (DDG-8)			
1129	3/4" Drain Globe Valve	1	25 May 83
1142	2" FO Gate Valve	1	13 Jun 83
Q130	1/2" Drain Globe Valve	1	17 Jun 83
A141	#2B Boiler FQ Control Valve	1	17 Jun 83
LEAHY (CG-16)			
0916	1-1/2" #1A Reducing Valve (5-92-0-E)	1	1 Aug 85
0925	1-1/2" #2A Reducing Valve (5-119-0-E)	1	1 Aug 85
0932	1-1/2" #1B 1200/1600# Reducer Valve (5-92-0-E)	1	6 Aug 85
1003	3-1/2" Combo Exhaust/Relief Valve (5-92-0-E)	1	12 Aug 85
0807	4" #1 Hytrol Valve (5-92-1-E)	1	12 Aug 85
1032	3-1/2" Combo Exhaust/Relief Valve	1	12 Aug 85
LEFTWICH (DD-984)			
1019	1" Steam Regulating Valve	1	14 Sep 83
LEWIS B. PULLER (FFG-23)			
0012	L.O. Valve	1	5 May 83
0943	Exhaust Manifold	4	6 Feb 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
MARVIN SHIELDS (FF-1066)			
2A72	Steam Bypass Valve	1	14 Jun 83
2669	Forced Draft Blower Globe Valve	1	7 Mar 84
2667	Forced Draft Blower Globe Valve	1	7 Mar 84
2665	Forced Draft Blower Globe Valve	1	7 Mar 84
2664	Main Steam Pump Globe Valve	1	7 Mar 84
2663	Main Feed Pump Globe Valve	1	7 Mar 84
Q313	1-1/2" Prairie Masker Globe Valve	1	15 Mar 84
Q967	3/4" HP Steam Drain Globe Valve	1	15 Mar 84
QA67	3/4" HP Steam Drain Globe Valve	1	15 Mar 84
Q362	1/4" Main Steam Globe Valve	1	26 May 84
MDSU			
A014	Diesel Exhaust Manifold	1	15 Mar 84
MERRILL (DD-976)			
1231	Check Valve	1	23 Jun 83
MEYERFORD (FF-1058)			
6011	Valve	1	29 Oct 84
MONTICELLO (LSD-35)			
0809	Main Feed Pump Relief Valve	1	27 May 83
0539	Main Feed Pump Relief Valve	1	27 May 83
Q874	3/4" Superheater Drain Valve	2	9 Aug 83
MOUNT VERNON (LSD-39)			
0786	Valve	2	1 Apr 83
Q171	3/4" HP Drain Valve	1	17 Feb 84
1050	Gauge Glass Cut-out Valve	1	2 Mar 84
Q032	#1B HP Drain Valve	1	15 Apr 84

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
NEW ORLEANS (LPH-11)			
2090	F.O. Quick-Closing Valve	1	28 Jul 83
Q135	1/4" #1A Boiler Globe Valve	2	21 Oct 83
Q060	1/2" Boiler Globe Valve	1	24 Oct 83
Q475	1/4" Globe Valve	4	26 Oct 83
0288	Bilge Stripping Pump	1	15 Mar 84
0860	Diesel Engine Manifold/Elbow	1	28 Mar 85
2025	4" Auxiliary Steam Globe Valve	2	21 May 85
O'CALLAHAN (FF-1051)			
Q801	HP Turbine Steam Chest Gauge Cut-out Valve	1	17 May 83
2680	5" Gate Valve	1	1 Aug 83
0365	Boiler Bottom Blowdown Valve	1	1 Aug 83
A365	Boiler Bottom Blowdown Valve	1	1 Aug 83
B365	Boiler Bottom Blowdown Valve	1	1 Aug 83
C365	Boiler Bottom Blowdown Valve	1	1 Aug 83
D365	Boiler Bottom Blowdown Valve	1	1 Aug 83
2630	Reducer	1	1 Aug 83
2632	L.O. Regulating Valve	1	1 Aug 83
Q449	1/2" Boiler Injection Globe Valve	1	25 Aug 83
Q748	3/4" Superheater Drain Globe Valve	3	30 Aug 83
OGDEN (LPD-5)			
Q152	#2A Main Feed Pump Valve	1	28 Apr 83
1186	1/2" Relief Valve	1	27 May 83
1188	3/4" Relief Valve	1	9 Jun 83
A188	3/4" Relief Valve	1	9 Jun 83
OKINAWA (LPH-3)			
0039	1/4" Main Steam Globe Valve	4	17 Jun 83
0039	1/2" Main Steam Globe Valve	2	17 Jun 83
0039	2" Shore Steam Riser Globe Valve	2	17 Jun 83
Q313	#2 Boiler Sample Globe Valve	5	21 Jun 83
Q394	1-1/2" Aux. Steam Drain Globe Valve	1	1 Aug 83
Q394	1/2" Auxiliary Steam Drain Globe Valve	2	
Q712	1/2" Superheater Globe Valve	2	21 Oct 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
OKINAWA (LPH-3) (Cont'd)			
Q707	1/2" Boiler Globe Valve	2	21 Oct 83
Q711	3-1/2" Main Steam Globe Valve	1	21 Oct 83
Q706	4-1/2" Main Steam Globe Valve	1	21 Oct 83
Q715	2-1/2" Superheater Globe Valve	1	21 Oct 83
Q713	1/2" Superheater Globe Valve	2	28 Oct 83
Q709	1/2" Superheater Globe Valve	2	28 Oct 83
Q710	1/2" Superheater Globe Valve	2	28 Oct 83
—	Searchlight Components	10	29 Oct 84
4487	1-1/2" Globe Valve	1	29 Oct 84
4477	Main Feed Valve	2	30 Oct 84
4478	Main Feed Valve	1	30 Oct 84
—	Searchlight Components	10	1 Nov 84
4773	Steam Valve	1	26 Nov 84
PHIB CB-1			
0773	Exhaust Manifold/Elbow	2	3 Jul 85
0762	Exhaust Manifold	1	19 Jul 85
0764	Exhaust Manifold/Elbow	2	19 Jul 85
PHIT COM 1			
0764	Exhaust Manifold/Elbow	2	5 Nov 84
REASONER (FF-1063)			
2721	5" Valve	1	15 Jul 83
4696	Steam Valve	1	21 Jul 83
4697	3/4" Regulating Valve	1	21 Jul 83
4780	5" #1A Boiler Gate Valve	1	28 Jul 83
4781	5" #1B Boiler Gate Valve	1	28 Jul 83
4782	5" Globe Valve	1	28 Jul 83
Q510	1/2" LP Aux. Steam Globe Valve	4	1 Aug 83
Q500	1/2" LP Aux. Steam Globe Valve	4	1 Aug 83
Q509	LP Auxiliary Steam Drain Globe Valve	7	1 Aug 83
Q505	1/2" SSTG Drain Globe Valve	4	9 Aug 83
QA90	1/4" Main Steam Drain Globe Valve	1	18 Aug 83
Q490	1/4" Main Steam Drain Globe Valve	1	18 Aug 83
Q819	Exhaust F.O. Valve	1	19 Aug 83
Q750	Main Steam Drain Valve	1	19 Aug 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
REASONER (FF-1063) (Cont'd)			
Q331	Feedwater Drain Valve	1	19 Aug 83
Q604	3" Main Steam Gate Valve	1	23 Aug 83
Q604	1/2" Main Steam Globe Valve	1	
Q752	Main Steam Valve	1	29 Aug 83
Q063	1/4" Boiler Gage Cut-out Globe Valve	1	14 Feb 84
2823	3" Valve	1	29 Oct 84
5379	#1C Throttle Valve (5-79-0-E)	1	4 Jan 85
5174	#1A Main Feed Pump Throttle Valve (5-79-0-E)	1	4 Jan 85
5374	#1C Combo Exhaust Relief Valve (5-79-0-E)	1	6 Feb 85
2018	Stanchion	64	26 Feb-26 Mar 85
2022	Net Frame	14	11 Mar 85
ROARK (FF-1053)			
Q233	1/2" Steam Strainer Globe Valve	2	28 Oct 83
Q265	#1A Steam Valve	1	16 Jan 84
0127	Valve	1	12 Aug 85
0002	1-MC Cover	1	23 Aug 85
ROBISON (DDG-12)			
Q957	Superheater Valve	1	12 Oct 83
Q238	2-1/4" Main Steam Globe Valve	1	12 Oct 83
Q980	1/2" Fire Pump Globe Valve	3	21 Oct 83
Q264	1-1/4" F/F Globe Valve	1	25 Oct 83
Q136	1/4" F.O. Globe Valve	2	25 Oct 83
Q328	Auxiliary Boiler Valve	1	8 Nov 83
Q991	1/2" MFP Globe Valve	3	25 Nov 83
Q992	MFP Main Steam	1	25 Nov 83
Q337	1/2" Main Steam Globe Valve	3	25 Nov 83
Q391	1/2" MFP Globe Valve	2	25 Nov 83
Q000	1/2" HP Drain Valve	1	28 Nov 83
Q979	1/2" #1A Main Feed Pump Globe Valve	1	28 Nov 83
Q998	1/2" Main Steam Drum Globe Valve	3	28 Nov 83
Q058	#1A Boiler Backfill Valve	1	1 Dec 83
Q059	#1B Boiler Backfill Valve	1	1 Dec 83
Q061	1-1/2" Boiler Bleeder Globe Valve	2	1 Dec 83
Q060	1-1/2" Boiler Bleeder Globe Valve	2	1 Dec 83
Q999	HP Steam Main Feed Pump Valve	1	8 Dec 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
SALVAGE			
0120	Diesel Pump Exhaust Pipe & Manifold	1	26 May 83
SAN BERNARDINO (LST-1189)			
1082	1" Relief Valve	1	9 Jun 83
1083	1" Relief Valve	1	9 Jun 83
1084	1" Relief Valve	1	13 Jun 83
1336	Bottom Blowdown Guardian Valve	1	14 Jun 83
A349	Pump Casing	1	15 Jul 83
Q027	Net Frame	24	6-21 Mar 85
SBU-12			
0588	Exhaust Manifold	1	11 Jul 83
0589	Exhaust Manifold	1	11 Jul 83
0033	Exhaust Manifold	1	11 Mar 84
0187	Exhaust Manifold	2	10 Dec 84
0036	Diesel Engine Manifold/Elbow	5	10 Jan 85
0010	Engine Manifold	4	19 Feb 85
0009	Engine Manifold	2	21 Mar 85
0208	Engine Exhaust Manifold	2	28 Mar 85
0207	Diesel Engine Manifold	2	28 Mar 85
0642	Diesel Engine Manifold	3	28 Mar 85
0002	Engine Manifold	6	22-31 May 85
SBU-13			
0026	Exhaust Manifold	1	22 Apr 83
0004	Diesel Engine	1	14 Jun 83
0037	Manifold	12	29 Oct-13 Nov 84
0075	Manifold/Elbow	2	27 Nov 84
0038	Exhaust Manifold	2	16 Jan 85
0031	Engine Elbow	1	7 Feb 85
0107	Engine Manifold/Elbow	3	22 May 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
SCHENECTADY (LST-1185)			
8004	#1B Auxiliary Boiler Soot Blower	1	29 Jan 85
8005	#1A Auxiliary Boiler Soot Blower	1	29 Jan 85
	Watertight Door	26	19 Apr-17 Jul 85
	Vent Screen	1	2 May 85
	Raised Deck Hatch	11	3 May-13 Aug 85
	Locker Hinge	212	8 May-16 Jul 85
	Scuttle	12	15 May-16 Aug 85
	Stanchion	36	16 May 85
	Line Reel/Mount	8	28-31 May 85
	Fairlead Sheave/Cover/Bearing	10	31 May-7 Aug 85
	Vent Cover	2	12 Jul 85
	Stern Gate Winch Brake Cover	1	24 Jul 85
	Guard	2	29-30 Jul 85
	Davit Cover	1	2 Aug 85
	Safety Platform	1	2 Aug 85
	Vent Ducting	5	7-8 Aug 85
SCHOFIELD (FFG-3)			
Q449	1/2" Chemical Injection Tank Valve	3	11 Apr 83
7488	Steam Reducer	1	20 May 83
Q462	3/4" Steam Globe Valve	2	28 Jun 83
Q536	3/4" LP Drain Globe Valve	2	15 Aug 83
Q534	3/4" Boiler Drain Globe Valve	2	22 Aug 83
Q535	LP Drain Globe Valve	1	29 Aug 83
Q537	3/4" LP Drain Globe Valve	2	29 Aug 83
Q533	3/4" LP Drain Globe Valve	1	29 Aug 83
SIMA (SD)			
0533	1-1/2" Steam Regulating Valve	2	13 Jun 83
	Strainer	1	14 Jan 85
—	Parking Sign	12	22 Mar-15 Apr 85
5362	Machine Stand	1	6 Aug 85
ST. LOUIS (LKA-116)			
Q863	Desuperheater Valve	1	22 Aug 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
STEIN (FF-1065)			
5997	3" Auxiliary Steam Gate Valve	1	21 Apr 83
6003	2-1/2" Auxiliary Steam Valve Yoke	1	21 Apr 83
6001	Auxiliary Steam Valve Yoke	1	28 Apr 83
6005	3" Auxiliary Steam Gate Valve	1	28 Apr 83
5998	3" Isolation Gate Valve	1	28 Apr 83
Q175	Desuperheater Valve	1	11 Jul 83
Q221	1-1/2" F.O. Valve	1	9 Aug 83
Q419	Steam Valve	1	15 Dec 83
Q457	1" Cut-Out Valve	1	29 Mar 85
Q650	3/8" Globe Valve	1	4 Apr 85
A004	6" Exhaust Relief Valve (1-90-0-E)	1	14 May 85
0191	5" Check Valve	1	31 May 85
Q754	3/4" Bypass Valve	1	11 Jun 85
Q754	5" Main Feed Stop Valve	1	11 Jun 85
Q965	3" Seal Ring Valve	1	21 Jun 85
2348	Watertight Door	8	26 Jun-7 Jul 85
2343	Turtleback	3	1-2 Jul 85
2339	Portable Davit Bracket	2	1-2 Jul 85
0673	B.P.D.M. Cable Cover (1-156-0)	9	2 Jul 85
TARAWA (LHA-1)			
Q412	Hydraulic Cut-out Valve	1	17 Jan 82
Q905	3" Gate Valve	1	5 Oct 84
THOMASTON (LSD-28)			
Q164	1/2" #1 Ballast Pump LP Drain Globe Valve	4	26 May 83
Q165	1/2" #2 Ballast Pump LP Drain Globe Valve	4	26 May 83
Q162	1/2" #1A MFP LP Drain Globe Valve	3	26 May 83
Q163	1/2" #1B MFP LP Drain Globe Valve	4	26 May 83
4041	HP Drain Valve	1	8 Jul 83
1852	#2 Boiler Economizer	1	11 Jul 83
4042	LP Turbine	1	11 Jul 83
0373	Turbo Casing Relief Valve	1	15 Jul 83
0372	Turbo Casing Relief Valve	1	15 Jul 83
1878	#2 Auxiliary Bypass Piping/Valve	1	27 Jul 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
TRIPOLI (LPH-10)			
3346	Main Steam Valve	1	18 Apr 83
0701	Auxiliary Steam Guarding Valve	1	12 May 83
Q565	1/2" Boiler Sample Cooler Globe Valve	2	17 Jan 84
B978	Soot Blower	2	3 Oct 84
Q905	3" Gate Valve	1	5 Oct 84
1262	Combo Exhaust/Relief Valve	1	27 Nov 84
1861	Diesel Engine Manifold	2	23 Jan 85
0785	6" Gate Valve (6-85-0)	1	10 Apr 85
0728	Valve	1	22 Aug 85
7262	6"x8" #1 SSTG Exhaust Relief Valve	1	22 Aug 85
7371	8" Gate Valve	1	30 Aug 85
TRUXTUN (CGN-35)			
1207	Hawse Pipe Cover	2	17 Oct 84
—	Stanchion Net Frame	8	17 Oct 84
—	Net Frame	4	22 Oct 84
0075	Gun Mount/Handle/Plate	4	14 Nov 84
—	P-250 Box/Gas Cover	2	
—	Portable Davit	4	22 Aug 85
—	Bottle Rack	7	10 May 85
VANCOUVER (LPD-27)			
1215	3" Auxiliary Steam Reducer	1	7 Sep 83
1216	Steam Reducer	1	7 Sep 83
Q633	2" 600# Steam Globe Valve	1	21 Sep 83
Q632	2" 600# Steam Gate Valve	1	21 Sep 83
Q578	2" 600# Steam Globe Valve	1	21 Sep 83
Q577	2" Steam Globe Valve	1	21 Sep 83
Q611	Auxiliary Steam Valve Bonnet	1	3 Apr 83
A712	3/4" In-Line Desuperheater Valve	1	7 May 85

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
WILLIAM H. STANDLEY (CG-32)			
A594	1" Constant Pressure Regulating Valve (5-116-0-E)	1	26 Dec 84
1379	1" Reducer (5-92-0-E)	1	10 Jan 85
1010	MWB Manifold	1	11 Mar 85
Q357	3" Gate Valve (5-92-0-E)	2	28 Mar 85
Q357	Auxiliary Steam Bypass Valve (5-92-0-E)	2	28-29 Mar 85
Q359	1/2" 1500# Globe Valve	3	29 Mar 85
Q360	3/4" CRMO Globe Valve	1	29 Mar 85
2287	1-1/2" #1 FR Reducing Valve (5-72-0-E)	1	14 May 85
1408	6" Diaphragm Control Valve (5-92-0-E)	1	22 May 85
2288	2" #1 FR Reducing Valve (5-72-0-E)	1	22 May 85
1407	6" Diaphragm Control Valve	1	22 May 85
1473	3" Combo Exhaust/Relief Valve (5-116-0-E)	1	24 May 85
2266	1" Pump Governor Valve (5-72-0-E)	1	30 May 85
WADDELL (DDG-24)			
Q475	1/2" 600# Steam Globe Valve	1	23 Jun 83
Q311	3/4" 600# Steam Globe Valve	1	23 Jun 83
Q966	1" Soot Blower Globe Valve	1	12 Jul 83
0965	1" Soot Blower Globe Valve	1	12 Jul 83
Q218	1/4" Gage Root Valve	2	22 Jul 83
3405	Valve	1	25 Jul 83
Q518	1/2" Chemical Injection Valve	2	30 Aug 83
Q276	1/2" Steam Globe Valve	1	31 Aug 83
Q277	1/2" Steam Globe Valve	1	31 Aug 83
Q992	HP Auxiliary Steam Drain Valve	1	9 Sep 83
Q138	Steam System Component	1	15 Sep 83
Q139	Soot Blower	1	15 Sep 83
Q224	1/2" Globe Valve	1	15 Sep 83
Q168	1/2" Superheater Drain Check Valve	1	22 Sep 83

Table A4-1-1 WSA-PRODUCTION SUMMARY (Cont'd)

JSN	COMPONENT	QUANTITY	WSA DATE
WADSWORTH (FFG-9)			
—	Reach Rod	1	26 Feb 85
1158	Watertight Door/Frame	1	26 Feb 85
—	Deck Hatch W/Scuttle	1	27 Feb 85
1164	Unrep Shackle	2	27 Feb 85
1153	Light Bracket (Pipe)	27	8 Mar 85
1154	Searchlight Yoke	4	8 Mar 85
1160	FAS Swivel Arm Assembly	2	12 Mar 85
1159	FAS Bulkhead Swivel	4	22 Mar 85
1161	Light Bracket	16	12 Mar 85
—	Stanchion	10	26 Mar 85

Table A4-1-2 ESP PRODUCTION SUMMARY
(31 October 1985 - Cutoff Date)

INVOICE NO.	COMPONENT	QUANTITY	INVOICE DATE
ALBERT DAVID (FF-1050)			
D4917	Applicator (10')	10	2 Sept 84
D4917	Applicator (4')	14	2 Sept 84
D4917	Speaker Cover	5	2 Sept 84
D4917	Handrail	6	2 Sept 84
D4917	Smoke Float Rack	6	2 Sept 84
D4917	Stern Light	2	2 Sept 84
D4917	Exhaust Screen	1	2 Sept 84
D4917	Signal Light	4	2 Sept 84
D4917	Line Reel	11	2 Sept 84
D4917	Cable Reel	2	2 Sept 84
D4917	Pyro Locker Shield	30	2 Sept 84
D5378	Vent Screen	8	31 Oct 84
D5855	Vent Screen	22	24 Jan 85
D5855	Riser Guard	2	24 Jan 85
D5891	Electric Box Cover	4	30 Jan 85
---	Electrical Power Tray	1	26 Feb 85
---	Gun Mount	1	26 Feb 85
---	Platform	2	26 Feb 85
BERKELEY (DDG-15)			
D5204	Signal Light Filter	5	9 Oct 84
D5855	Boxes	—	24 Jan 85
---	Applicator	5	26 Feb 85
---	Phone Box	4	26 Feb 85
---	Jackstaff	2	26 Feb 85
---	Vent Screen	18	26 Feb 85
---	Small Screen	4	26 Feb 85
---	Electrical Box	6	26 Feb 85
---	Vent Screen	1	26 Feb 85
---	Searchlight Yoke	5	26 Feb 85
---	Searchlight	5	26 Feb 85
---	Miscellaneous	40	26 Feb 85
---	Vent Screen	12	23 Jul 85
---	Light Fixture	5	23 Jul 85
BRISTOL COUNTY (LST-1198)			
A1771	Pyro Locker Shield (2' x 3')	9	22 Oct 85
A1771	Pyro Locker Shield (5' x 3')	3	22 Oct 85

Table A4-1-2

ESP PRODUCTION SUMMARY (Cont'd)

INVOICE NO.	COMPONENT	QUANTITY	INVOICE DATE
BRONSTEIN (DD-1037)			
D4917	"J" Box	15	2 Sept 85
D4917	Applicator (4')	2	2 Sept 85
D4917	Applicator (10')	2	2 Sept 85
D4917	Light	2	2 Sept 85
D4917	Vent Screen	11	2 Sept 85
D4917	First Aid Box	1	2 Sept 85
COPELAND (FFG-25)			
A0184	Pyro Locker	5	26 Feb 85
A0366	Speaker Cover	17	6 Mar 85
A0461	Applicators (10')	4	8 Mar 85
A0507	MWB Cable Screen	1	22 Mar 85
A0507	Boat Davit Screen	3	22 Mar 85
A0507	Phone Box/Holder	6	22 Mar 85
A0507	Speaker Horn	8	22 Mar 85
A0507	Speaker Box	1	22 Mar 85
A0508	Life Jacket Locker	11	22 Mar 85
A0462	Floodlight	32	18 Mar 85
A0504	Searchlight (57 pcs.)	2	22 Mar 85
A0503	Deck Edge Light Guard	28	22 Mar 85
A0505	Captain's Chair (4 pcs)	1	22 Mar 85
A0505	Loud Speaker (5 pcs.)	1	22 Mar 85
A0505	Safety Reel	2	22 Mar 85
A0567	Capstan Controller	2	28 Mar 85
A0562	Applicator (4')	7	29 Mar 85
A0562	Applicator (10')	4	29 Mar 85
A0562	Applicator (12')	2	29 Mar 85
A0562	Searchlight (38 pcs.)	2	29 Mar 85
A0567	Floodlight	10	29 Mar 85
A0567	Storage Box	2	29 Mar 85
FLETCHER (DD-992)			
—	Pyro Locker w/Shield	4	26 Feb 85
—	Light	6	26 Feb 85
—	Light Shield	13	26 Feb 85
—	Unrep Light	9	26 Feb 85
—	Pyro Locker w/Shield	10	26 Feb 85
—	Pyro Locker w/Shield	4	26 Feb 85

Table A4-1-2

ESP PRODUCTION SUMMARY (Cont'd)

INVOICE NO.	COMPONENT	QUANTITY	INVOICE DATE
FLETCHER (DD-992) (Cont'd)			
—	Vent Screen	2	26 Feb 85
—	Floodlight	23	26 Feb 85
—	Filter	5	26 Feb 85
—	Vent Screen	28	26 Feb 85
—	Applicator	8	26 Feb 85
—	Deck Edge Light Guard	27	26 Feb 85
—	Unrep Light	19	26 Feb 85
—	Boxes	2	26 Feb 85
—	Floodlight	1	26 Feb 85
—	Storage Box	2	26 Feb 85
A2047	Vent Screen	31	29 Oct 85
A2047	Vent Screen	6	29 Oct 85
A2047	Floodlight	13	29 Oct 85
A2094	Deck Edge Light Guard	13	31 Oct 85
A2087	Floodlight Cover	20	31 Oct 85
A2111	Applicator	9	1 Nov 85
A2111	P-250 Box/Cover	2	1 Nov 85
A2113	Signal Light Filter	3	1 Nov 85
A2112	Hose Box/Lid	2	1 Nov 85
FRESNO (LST-1182)			
D5424	Vent Screen	5	15 Nov 84
HENRY B. WILSON (DDG-7)			
—	Searchlight	3	26 Feb 85
—	Miscellaneous	37	26 Feb 85
D0363	Searchlight	2	6 Mar 85
—	Miscellaneous	26	6 Mar 85
HORNE (CG-30)			
D5744	Vent Screen	25	4 Jan 85

Table A4-1-2

ESP PRODUCTION SUMMARY (Cont'd)

INVOICE NO.	COMPONENT	QUANTITY	INVOICE DATE
ROURKE (FF-1053)			
A2046	P-250 Box	3	29 Oct 85
A2046	Jackstaff	1	29 Oct 85
A2046	Wind-Direction Pole	1	29 Oct 85
A2046	Davit (7")	1	29 Oct 85
A2046	Davit Socket (7")	1	29 Oct 85
A2075	Pyro Locker	7	30 Oct 85
A2075	Binocular Stand	2	30 Oct 85
A2091	P-250 Box	3	31 Oct 85
A2090	Unrep Box	8	31 Oct 85
A2148	Davit (4")	3	7 Nov 85
A2148	Davit (7")	1	7 Nov 85
A2148	Jackstaff	1	7 Nov 85
SCHENECTADY (LST-1185)			
A1815	Pyro Locker	4	14 May 85
A1815	Storage Locker	3	14 May 85
A1815	File Holder	1	14 May 85
A1810	Davit	2	14 May 85
A1810	S/P Phone Box	3	14 May 85
A1810	Pyro Locker	2	14 May 85
A1810	Life Jacket Locker	1	14 May 85
A1810	First Aid Box	1	14 May 85
A1818	Hose Locker	2	15 May 85
A1818	Pyro Locker	3	15 May 85
A1887	Fire Alarm Box (5 pcs.)	1	24 May 85
A1887	Applicator (4')	8	24 May 85
A1887	Storage Locker	6	24 May 85
A1887	Shelves	12	24 May 85
A1887	Electrical Box	2	24 May 85
A1436	Phone Box	20	14 Aug 85
A1436	Vent Cover	1	14 Aug 85
A1436	Vent Ducting	1	14 Aug 85
A1441	Vent Cover	2	16 Aug 85
A1441	P-250 Box	2	16 Aug 85
A1441	Box	5	16 Aug 85
A1462	Vent Cover	2	21 Aug 85
A1462	Vent Cover w/Handrail	1	21 Aug 85
A1541	Vent Cover	2	4 Sept 85
A1751	Vent Cover	2	4 Sept 85
A1587	Vent Ducting	2	12 Sept 85
A1599	Vent Cover	2	16 Sept 85

Table A4-1-2

ESP PRODUCTION SUMMARY (Cont'd)

INVOICE NO.	COMPONENT	QUANTITY	INVOICE DATE
SCHENECTADY (LST-1185) (Cont'd)			
A1599	Shelves	12	16 Sept 85
A1599	Phone Cradle	10	16 Sept 85
A1599	First Aid Box	1	16 Sept 85
A1599	Storage Box	1	16 Sept 85
A1599	Panel	1	16 Sept 85
A1600	Electrical Box	9	16 Sept 85
A1600	P-250 Box	1	16 Sept 85
A1600	Vent Screen	7	16 Sept 85
A1744	Oil Spill Control Box	2	16 Oct 85
A1744	Control Box	1	16 Oct 85
TRUXTUN (CGN-35)			
D5298	Garbage Chute	1	24 Oct 84
A0943	P-250 Box	4	5 Jun 85
WADSWORTH (FFG-9)			
A0365	Pyro Locker	5	6 Mar 85
A0365	Capstan Controller	2	6 Mar 85
A0365	Searchlight	4	6 Mar 85
A0365	Unrep Light	17	6 Mar 85
A0365	Phone Box	6	6 Mar 85
A0365	Phone Holder	2	6 Mar 85
A0365	Boat Deck Floodlight	2	6 Mar 85
A0364	Unrep Light	24	6 Mar 85
A0502	Deck Edge Light Guard	26	22 Mar 85

NO. 7100-18-84 Rev 1

EFFECTIVE: _____

CANCELS: Original Issue

COORDINATION DRAFT



PROCESS INSTRUCTION

SHORE INTERMEDIATE MAINTENANCE
ACTIVITY, SAN DIEGO

NAVAL STATION, BOX 106
SAN DIEGO, CA 92136

TITLE: WIRE-SPRAYED ALUMINUM (WSA) FOR CORROSION
PROTECTION; NAVSEA CORROSION-CONTROL (CC)
SYSTEMS 1 & 2

SECTION:		Pg		Pg
I - EQUIPMENT	D-3	IV - QUALITY CONTROL	D-12	
II - MATERIAL	D-7	V - OPERATOR TRAINING & CERTIFICATION	D-24	
III - SAFETY	D-9	VI - METHOD	D-27	
		VII - FEEDBACK	D-40	

ORIGINATOR CODE: 3800
SHOP 061

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION: Update Production-Flow Chart (Fig. 3) and
amplification of Sections III, IV, V and VI

DATE

APPROVALS: ORIGINATOR: (7100/3800)

PLANNING: (2000)	<i>Philip G. Ziegler</i>	30 SEP 85
REPAIR OFFICER: (3090)	<i>Smith</i>	9-30-85
PRODUCTION: (3000)	<i>McLennan</i>	24 Oct 1985
SAFETY: (0140)	<i>John D. McManis</i>	30 SEP 85
QUALITY ASSURANCE: (5000)	<i>W. H. ...</i>	26 SEP 85
ENGINEERING: (7000)	<i>Karen Dill-Baldi</i>	25 Oct 85

REVIEW: Annually or whenever DOD-STD-2138(SH) is changed.

LEAD SHOP: Pilot Corrosion-
Control Shop
SHOP 061

ASSIST SHOPS: 72A 72C
11A 26A
17A 31M

CATEGORY: II (per COMNAVSEAINST 5250 (draft), NSY Thermal Spray Process Instructions are under PSNS as lead yard for development/changes; process must be followed by all NSYs).

REFERENCES:

- A. DoD-STD-2138(SH), Metal Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships, 23 Nov 81
- B. NAVSEA Corrosion-Control Manuals for Ship Classes FFG-7, LHA-1, FF-1052, DD-963, AO-177, LST-1179 and CG-16
- C. NAVSEA Shipboard Corrosion-Control Advisory (SCCA 6-83)
- D. Naval Reserve IMA-7 Training Program, Corrosion-Control Using Wire-Sprayed Aluminum, CNAVRES (Code 323A)
- E. NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems, 30 May 83

STANDARD DISTRIBUTION: (1 copy unless noted otherwise)

Code:	0140	3300	Shop:	11A	38C	67A
	2000	3600		17A	38D	67E
	2160	3700		26A	41A	67H
	2161 (3)	3800		26B	51A	72A
	2162 (3)	5000		31A	51B	72C
	2163 (3)	7000		31D	56A	72E
	3090	7100		31M	56C	06I (12)
	3100	7200		31H	56D	
	3200	7300		38B	56E	

Shore Intermediate		NAVSHIPYD CHASN	(Code 380)	(1)
Maintenance Activity		NAVSHIPYD LBEACH	(Code 380)	(1)
		NAVSHIPYD MARE	(Code 380)	(1)
Pearl Harbor	(2)	NAVSHIPYD PEARL	(Code 380)	(1)
Alameda	(2)	NAVSHIPYD PHILA	(Code 380)	(1)
Long Beach	(2)	NAVSHIPYD NORFOLK	(Code 380)	(1)
Charleston	(2)	NAVSHIPYD PUGET	(Code 380)	(1)
NAVAIRLANT	(2)	NAVSHIPYD Ports	(Code 380)	(1)
Little Creek	(2)	SUPSHIP Charleston	(Std Item Office)	(1)
Mayport	(2)	NAVSES PHILA	(Code 053B)	(1)
Norfolk	(2)	DTNSRDC/ANNA	(Code 2803M)	(1)
NAVSURFPAC Readiness		NAVSURFLANT Readiness		
Support Group	(2)	Support Group	(2)	

ADDITIONAL DISTRIBUTION: COMNAVSEASYS COM (SEA 05M1, 91AD121, 0704, 075) (1 copy each)

SCOPE: The scope of this process instruction covers the required equipment, method or industrial process, safety, quality control and personnel training/certification required for applying the NAVSEA Corrosion-Control (CC) Coating, Systems 1 and 2 (high- and low-temperature wire sprayed aluminum (WSA)) (Ref. A) to ferrous and aluminum-alloy substrates in accordance with Ref. B.

SECTION I
EQUIPMENT

1.1 The equipment specified in this process instruction shall conform to DoD-STD-2138(SH) (Ref. A). The portable/containerized WSA system, planned for the SIMA Pilot CC Shop installed in the West End of Building 61, has been designed and fabricated to meet these requirements.

1.2 Figure 1 gives the Pilot CC Shop arrangement in the West End of Building 61. The major equipments for the various stations in the CC Shop are:

<u>STATION</u>	<u>NAME/FUNCTION</u>	<u>EQUIPMENT(s)</u>
1	Receipt Inspection	
2	Degreasing	Vapor degreaser, 1,000 gal.
3	Masking	
4	Strip Blasting	Walk-in (10'wide x 15'deep x 13'high) w/vacuum recovery and media recycling
5	Anchor-Tooth Blasting	FSI Model 5003A, Side-Loading Blasting Unit
6	WSA	FSI Model 5003B, Side-Loading Thermal-Spray Unit
7	Painting	10-ft water wash booth
8	Installation Kit Makeup and Storage	Storage Bins (in Bldg. 149)
9	Final Inspection and Customer Pickup	

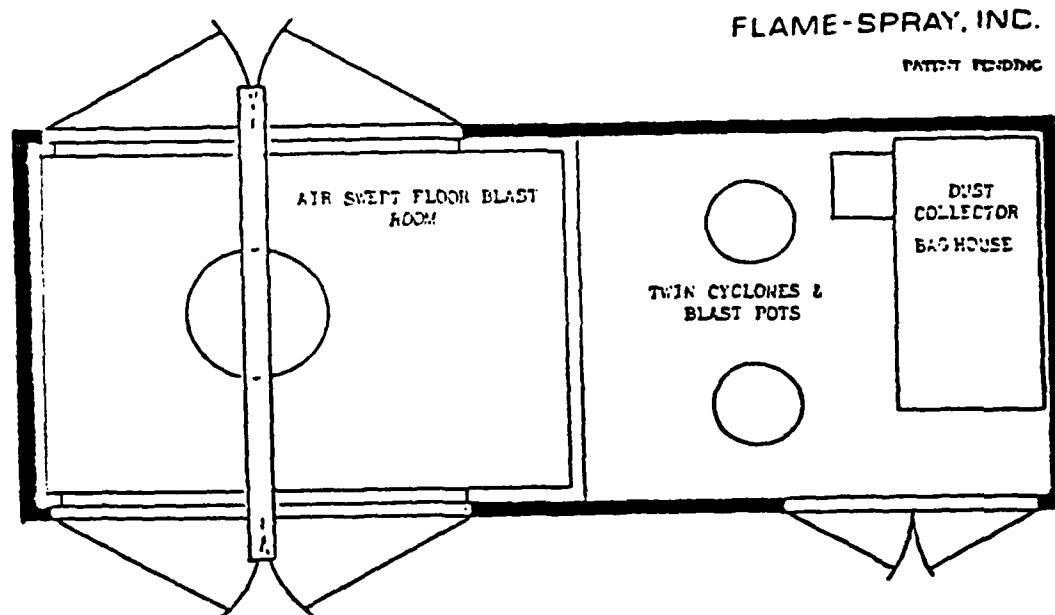
Figure 2A and 2B are the plan view and the listing of the major components of the Portable/Containerized WSA System in Station 4 and 5.

**Naval Station
San Diego, CA.**

The map illustrates the layout of Naval Station San Diego. Key features include:

- Parking Areas:** Labeled "PARKING ONLY" in several locations, including a large area near the center-left and smaller lots throughout the station.
- Buildings:** Numerous rectangular structures are depicted, some labeled with numbers like 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893,





EQUIPMENT DESCRIPTION

MODEL 5003 CONTAINER "A" BLAST CABINET - SIDE-LOADING

(Size: 8' x 8' x 20; Weight: 13,500 lbs.)

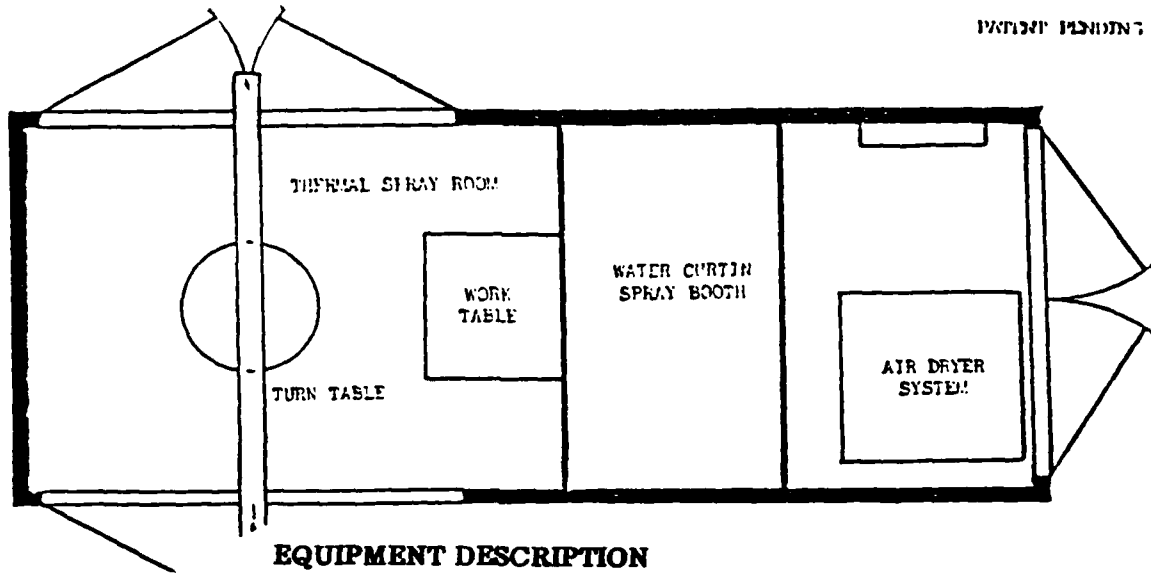
1. Self-contained Abrasive Blast Room, for use in strip blasting and anchor-tooth blasting for the Wire-Sprayed Aluminum Process.
Capacity: 7-1/2'highx7-1/2'widex10'long
2. A twin 600-lb. abrasive blasting pot and an air-swept floor sub-system is used to rapidly collect and change blasting media from strip blasting to anchor-tooth blasting.
3. 1 each Monorail with 2,000 lb. hoist.
4. 1 each 48" Floor Mounted Turntable.
5. A completely self-contained Dust Collector Sub-System is included which meets all air pollution and safety requirements.
6. All blasting safety equipment and hoses and lighting are also supplied.

FIGURE 2A.

**Portable/Containerized WSA System
FSI Model 5003A, Side Loading-Blasting Unit**

FLAME-SPRAY, INC.

PATENT PENDING



EQUIPMENT DESCRIPTION

MODEL 5003 CONTAINER "B" SPRAY FACILITY - SIDE-LOADING

(Size: 8' x 8' x 20: Weight: 14,000 lbs.)

1. 1 each - Air Drying Sub-System modified for Wire Sprayed Aluminum applications meeting air quality requirements of DoD-STD-2138(SH).
2. 1 each - Water-Wash Spray Booth modified to meet air pollution requirements and safety requirements. Work area - 7'10" wide x 10' long x 7'10" high.
3. 2 each - METCO 12E combustion wire guns and all related hoses, gauges, flow meters and wire racks.
4. A 3-month supply of spare parts for the above mentioned equipment.
5. Electrical Distribution Panels - approved power panels and all safety switches and supplies.
6. Miscellaneous Equipment:
 - .. 2 each - Work benches (collapsible) - Air Piping Distribution all valved compressed bottle gas storage rack. All venting (intake and exhaust) vents, lockable roof ladder - removable roof - exhaust stock - watertight seals.
 - .. 1 each - Turntable (removable)
 - .. 1 each - 100 psi, 250 cfm electrically-driven air compressor
7. Safety and quality assurance equipment supplied to meet the requirements of DoD-STD-2138(SH).

FIGURE 2B.

**Portable/Containerized WSA System - FSI Model 5003B,
Side-Loading Thermal-Spray Unit**

SECTION II

MATERIAL

2.1 ALUMINUM WIRE

Aluminum wire used for CC Systems 1 and 2 shall conform to MIL-W-6712. Wire surfaces shall be clean and free from scale, corrosion products, oil or other material which will adversely affect the application, density or adhesion of the coating. The wire shall be of uniform composition and quality, and free of seams, cracks, nicks or burrs. The wire shall be stored and handled carefully and uncoil readily and be free of bends, kinks or slivers that would prevent its passage through the spray gun.

2.2 GASES

Gases used for thermal spraying aluminum wire shall conform to:

<u>GAS</u>	<u>SPECIFICATION</u>
Oxygen	BB-0-925
Acetylene	BB-A-106

2.3 ABRASIVE BLASTING MEDIA

2.3.1 Strip Blasting

16-mesh garnet is used for strip blasting to abrasively clean painted and corroded surfaces. Degraded WSA and galvanized coating may be "blasted off", however, chemical removal is preferred (caustic for aluminum and acid for zinc). Chemical stripping services can be procured from San Diego Galvanizing for \$0.20/lb, \$50.00 minimum order.

2.3.2 Anchor-Tooth Blasting

Abrasive blasting particles used to provide the anchor tooth of 2 to 3 mils during final surface preparation of the substrate shall be one of the following:

<u>TYPE ABRASIVE</u>	<u>MESH SIZE</u>	<u>SURFACE TO BE BLASTED</u>
Aluminum Oxide Grit	16 - 30	Steel or Aluminum

The CC Shop routinely uses aluminum oxide grit, 16-mesh costing about \$0.45 /lb.

2.3.2.1 Restrictions

A. Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

B. Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been rescreened.

2.4 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and thermal spraying operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various tapes, plastic caps or plugs, hose sections and wood or metal inserts.

The masking tapes used are:

A. 2" Green Duct Tape, NSN 8315-00-074-5100.

B. Hi-Temp Al Foil Tape (0.007" thick, 3/4" wide x 36 yd. per roll, Stock No. 06004), T&F Division of SHR Industries, 3660 Edison Place, Rolling Meadows, IL 6008, (312) 392-8090.

2.5 CLEANING SOLVENTS

Toluene conforming to TT-T-548 and trichloroethane conforming to O-T-620C are approved cleaning solvents.

WARNING:

Toluene is flammable. Both toluene and trichloroethane are toxic. Use only in well-ventilated spaces. Do not use near open flames, blasting, thermal spraying work, or sources of sparks. Do not allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.6 QUALITY CONTROL

A dial surface profile gauge is also used to measure the anchor-tooth profile. Press-O-Film tape is used to measure and to provide a physical record of the anchor-tooth profile:

Press-O-Film (X-course)
Testex, Inc.
P. O. Box 867
Newark, Delaware 19711

The cost is approximately \$20/roll, 50 test coupons per roll.

SECTION III

SAFETY

Section 4.1 of DoD-STD-2138(SH) applies (Ref. B) and is reproduced in its entirety.

4. GENERAL REQUIREMENTS

4.1 Safety precautions (personnel hazard). All personnel concerned with metal spraying shall become familiar with and follow the practices specified in AWS C2.1, NAVSEA S9086-CH-STM-030, Chapter 074, Volume 3, and NAVSEA S9086-VD-STM-000, Chapter 631. Safety and health requirements as specified in OSHA 29 CFR 1910 shall also be followed.

4.1.1 Cleaning solvents (toluene or trichloroethane). Shipping containers are marked to indicate dangerous or safety related items. These labels shall be read prior to using the solvent and the stated precautions followed in their use. The following safety precautions shall be followed when using toluene and trichloroethane:

- (a) Toluene vapor is flammable - keep away from heat, sparks, and open flame.
- (b) Toluene and trichloroethane vapors are harmful and can be fatal - use only in adequate ventilation. Avoid prolonged breathing of vapor.
- (c) Avoid prolonged or repeated contact with skin.

4.1.2 Metal spray gases. NAVSEA S9086-CH-STM-030, Chapter 074, Volume 3 shall be used for guidance and the following safety precautions followed when using metal spray gases:

- (a) Inspect all gas equipment regularly for leaks and loose connections.
- (b) Charged gas cylinders are potentially dangerous. Keep cylinders away from heat. Always secure cylinders to keep them from toppling. Shut off gas and place valve caps on the cylinders when they are not in use.

- (c) Do not hang a metal spray gun on a regulator or cylinder valve. Provide for portable equipment storage or permanent work station.
- (d) Provide adequate ventilation of the work area before opening any of the gas valves. No container shall be presumed to be clean or safe until proven and certified safe by a Gas Free Engineer.
- (e) Never point a gas hose, air hose, or other pressurized item at any part of the human body, your own or others.

4.1.3 Blast cleaning. Safety precautions for abrasive blasting specified below and covered by NAVSEA S9086-VD-STM-000, Chapter 631 shall be followed.

- (a) If fire or explosion hazards are present, precautions shall be taken before any blast cleaning is initiated. If the structure previously contained flammable materials, it shall be purged of dangerous concentrations. Prior to commencing work, structure shall be certified safe by a Gas Free Engineer.
- (b) While blasting, face shields with dust hoods or helmets with forced fed purified air shall be used to protect the eyes, face, chin, and neck from airborne particles.
- (c) Safety glasses or goggles shall be worn by all persons near any blasting operation.
- (d) Blast hose shall be grounded to dissipate static charges.
- (e) Never point a blast nozzle at any part of the human body, your own or others.

4.1.4 Wire spray gun. Safety precautions for wire spray guns are as follows:

- (a) Wire spray guns shall be maintained in accordance with the manufacturer's recommendations.
- (b) Do not light the gun without having the wire in the nozzle. Without the wire in the gun, the flame can shoot back through the front wire guide, damaging the nozzle, guide, drive rolls, and causing injury to the operator.
- (c) Do not use matches for lighting wire spray guns because hand burns may result. Use a friction lighter, a pilot light or arc ignition.

4.1.5 Reduction of respiratory hazards. The following safety precautions shall be followed in order to reduce respiratory hazards:

- (a) Use of a wet spray booth with a positive exhaust system shall be used on board Navy ships and other closed areas to avoid the toxic or irritating effects of dust, fumes, and mists generated by metal spraying. Work stations shall have adequate air flow and safe breathing apparatus (see 5.2.1) in accordance with NAVSEA S9086-VD-STM-000, Chapter 631 and AWS C2.1.
- (b) Breathing zinc or aluminum dust may damage the respiratory system. If signs of operator discomfort develop (i.e., dizziness or nausea), stop spraying at once and determine if the ventilating and exhaust systems are working properly before resuming the spraying operation.

4.1.6 Personal protection. The following safety precautions shall be followed for personal protection:

- (a) Never permit spray dust to enter the eyes, mouth, cuts, scratches, or open wounds. After spraying, and especially before eating or handling food, wash hands thoroughly.
- (b) Finely divided metallic airborne particles can be hazardous from an explosive standpoint and partially wet metal dust creates a hazard of spontaneous combustion. For spraying in enclosed or internal spaces, see 4.4.5, category III.

4.1.7 Protective clothing. Flame-resistant clothing shall be used and leather or rubber gauntlets shall be worn. Clothing shall be strapped tightly around the wrists and ankles to keep dusts from harmful metal sprayed materials and abrasives away from the skin.

4.1.8 Reduction of noise hazard. Hearing protectors or properly fitted soft rubber ear plugs shall be used. Wads of cotton for hearing protection shall not be used since they do not protect against high intensity noise.

4.1.9 Eye and respiratory protection. Eye and respiratory protection shall be as follows:

- (a) Helmets, face shields, or goggles shall be used to protect the eyes during all metal spraying or blasting operations. It may be necessary for metal sprayers or blasters to use goggles at all times for protection against radiation or airborne particles from adjacent operations. Attendants or helpers shall be provided with proper eye protection.
- (b) While metal spraying, the helmet, face shield, or goggles shall be equipped with a suitable filter plate as required by NAVSEA S9086-CH-STH-030, Chapter 074, Volume 1 to protect the eyes from excessive infrared (as well as intense visible light) radiation. The following is a guide for the selection of the proper shade number:
 - (1) Wire flame spraying - Shades 2-4
 - (2) Metal spraying of powder - Shades 3-6
- (c) When metal spraying in the open, or where ventilation is adequate to eliminate the need for additional respiratory protection, properly shaded goggles only shall be worn. These shall be of the eyecup type, fitted with lenses of about 50 millimeters (mm) in diameter, or the coverup type for those wearing corrective spectacles.
- (d) The goggles shall have indirect ventilating fins to eliminate the danger from airborne particles and to reduce fogging.
- (e) While blasting, face shields or abrasive blasting helmets equipped with dust hoods shall be used to protect the eyes, face, chin, and neck from airborne particles.

4.1.10 Compressed air. The following safety precautions shall be followed when using compressed air:

- (a) Compressed air shall not be used to clean clothing.
- (b) Compressed air for metal spraying or blasting operations shall be used at pressures recommended by the equipment manufacturers.
- (c) Compressed air shall be clean and free of oil, moisture, and other contamination for blasting and metal spraying.

SECTION IV

QUALITY CONTROL

The quality control (QC) trade practices for thermal spraying in conformance with DoD-STD-2138(SH) and the Thermal Spray Manual of the American Welding Society will be followed. A summary of the major QC elements follow.

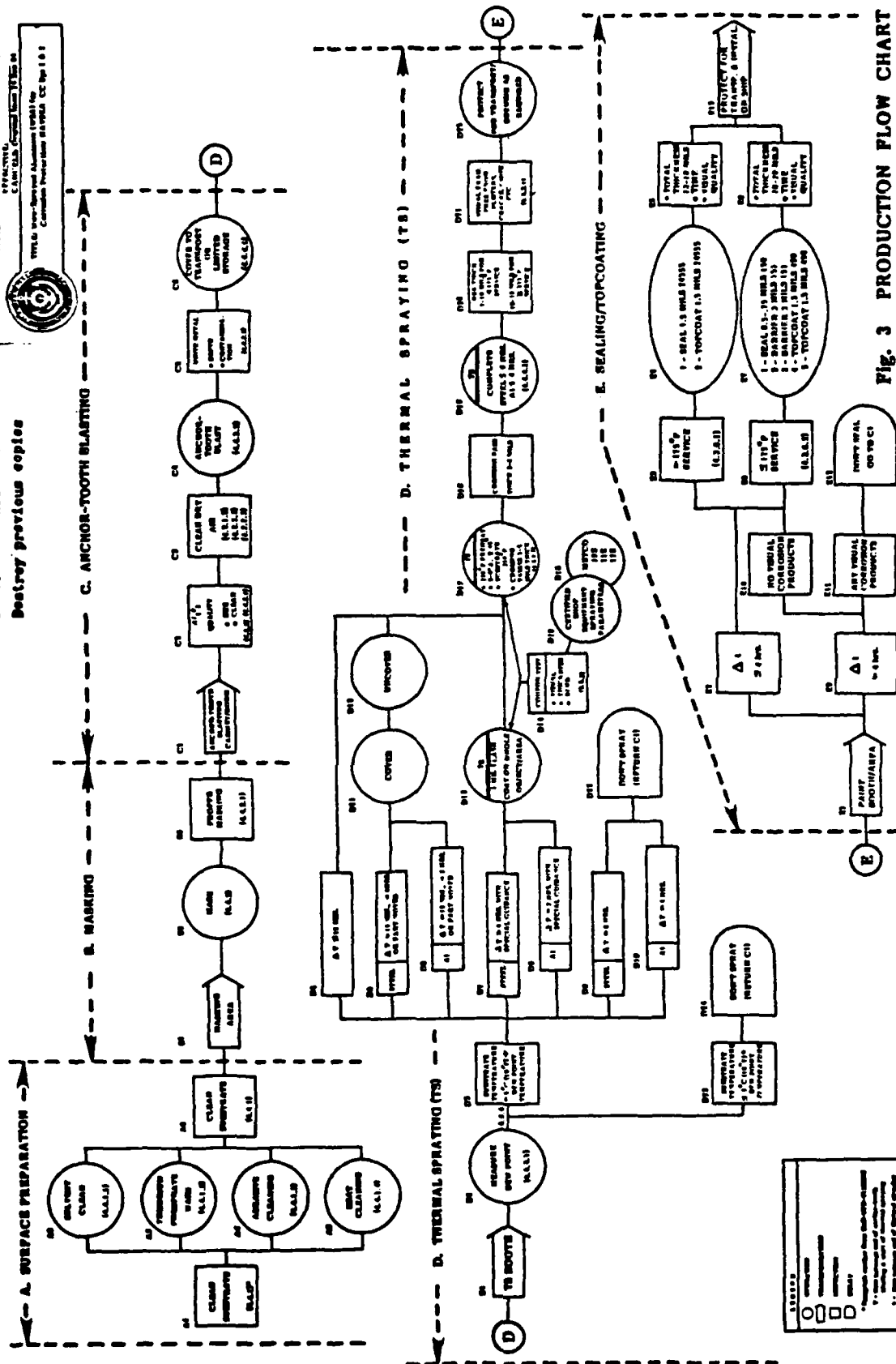
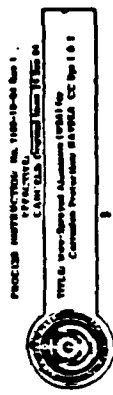
4.1 SET-UP OR PRE-PROCESS

<u>Item</u>	<u>Para. Ref. in DoD-STD-2138(SH) (Ref. B)</u>
A. Equipment and facility certified	5.1 and 5.2
B. Spray operator certified	5.4
C. Production QC records	5.5 and 5.7
D. Application procedure (equipment and spraying parameters and procedures) certified	5.3 and 5.6

4.2 IN-PROCESS

Figure 3, Production Flow Chart, specifies all the major in-process production steps in logical sequence. The quality-control actions are enclosed in a square. The QC inspection with their Production-Flow-Chart identification number for the five phases of the WSA coating process follow:

DRAFT No. 2
JUN 25 1965
Destroy previous copies



ID NO.	QC INSPECTION	AMPLIFYING INFORMATION FROM DoD-STD-2138
A1 and A6	A. SURFACE PREPARATION	
	Clean Substrate	<p>4.4 Metal spray process.</p> <p>4.4.1 Surface cleaning. Areas to be metal sprayed, and those adjacent thereto, shall be free from grease, oil, paint, corrosion products, moisture or any other foreign material that may contaminate the coating. If contamination is excessive, a trisodium phosphate solution may be used to clean the surface prior to solvent cleaning.</p> <p>4.4.1.1 Solvent cleaning. Prior to any masking, blasting, or spraying, surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with 4.3.1. Cleaning may be done by wiping, brushing, or spraying. Precautions shall be taken to protect any parts which may be attacked by the solvents.</p> <p>4.4.1.2 Contaminated surfaces. Surfaces shall be cleaned with a trisodium phosphate solution, rinsed with clear, potable water, and dried after solvent cleaning.</p> <p>4.4.1.3 Abrasive cleaning. Preliminary abrasive blast cleaning may be used to remove heavy or insoluble deposits. An inexpensive, disposable abrasive is recommended. Dust and debris shall be removed by dry compressed air "blow off" prior to anchor-tooth blasting.</p> <p>4.4.1.4 Heat cleaning. Porous materials that have been contaminated with grease or oil shall be solvent cleaned (see 4.4.1.2). If required, parts shall be heated in vented electric ovens for at least 4 hours to remove grease or contamination remaining after degreasing cleaning process. Steel alloys may be heated to 315°C (600°F) maximum. Aluminum alloys, except age-hardened alloys, may be heated to 150°C (300°F) maximum.</p>
B3	B. MASKING	
	Proper Masking	<p>4.4.2 Masking. Masking shall be performed on all adjacent areas which may be affected by abrasive blasting or metal spraying. The mask (tape) shall be applied tightly enough to prevent grit from seeping under the mask. Two layers of tape shall be applied with the second layer at right angles to the first. Protective masking shall be inspected for damage between the abrasive and metal spray processes and replaced if damaged.</p>

AMPLIFYING INFORMATION FROM DoD-STD-2138

QC INSPECTION

ID NO.

C. ANCHOR-TOOTH BLASTING

Aluminum Oxide
(Al₂O₃)
Blasting Medium
Quality

4.4.3.1 Aluminum oxide or angular chilled iron grit (see 4.3.3) shall be used for the final surface preparation of the substrate. Only aluminum oxide may be reused for anchor-tooth blasting. Prior to reuse, the aluminum oxide shall be screened using a 30-mesh screen, visually inspected for debris and oil contamination, and shall pass the following oil contamination test:

- Fill a clean 150 milliliter (5-ounce) vial or bottle half full of screened abrasive particles.
- Fill the remainder of the vial or bottle with clean water.
- Cap and shake vial or bottle.
- Inspect water for oil sheen.
- If any oil is observed, the abrasive particles shall not be used in the final anchor-tooth blasting process.
- Clean blasting equipment, replace blasting material, and retest.

Clean Dry Air

C3

4.2.1.2 Abrasive Blasting process shall utilize air having a maximum permissible contamination value of five mg condensed hydrocarbons per cubic meter of air output.

4.2.2.2 Air equipment. The air equipment used in the metal spraying system shall furnish air which is free of oil and moisture (less than 0.03 p/m oil). For the metallizing operation, a pressure of at least 415 kPa (60 lb/in²) shall be available at the air control unit. There shall be not more than 11 meters (m) (35 feet) of 10 mm (3/8 inch) inside diameter (1.4.) hose between the air control unit and the wire spray gun. Each metal spray outfit shall consist of all components and accessories listed in table I.

AMPLIFYING INFORMATION FROM DoD-STD-2138

TABLE 1. Equipment and quantity.

Equipment	Quantity	
	Class 8	Class 10
Metallizing gun, complete with lubricants, carry case, tool set, and manuals	1	1
Air caps	2	2
Wire nozzles	2	2
Hose set, complete	1	1
Regulator, oxygen	1	1
Regulator, fuel gas	1	1
Flowmeter, oxygen	1	1
Flowmeter, fuel gas	1	1
Flowmeter, air	1	1
Control unit	1	1
Wire reel and stand	1	1
Wire straightener	1	1
Gun mounting fixture	1	1

Clean Dry Air

C3
Cont'd

4.2.2.3 Air quality. In-line water and oil filters shall be located between the compressor and the metal spray equipment. These filters shall be periodically inspected and serviced to assure delivery of uncontaminated dry air. When greater control is required, automatic dew point measuring instruments with feedback to control the quality of air shall be installed. Optional equipment may be required as specified in the contract for special applications in accordance with MIL-M-3800.

4.4.4.2 Air quality. Any of the following procedures and equipment may be used to monitor water content of the compressed air:

- Open a valve downstream of the filter/dryer components slightly, allowing air to vent with a slightly audible flow into an open dry container for 1 minute. Any wetting or staining will indicate moisture or contamination.
- Repeat (a) above using a clean white cloth. Any wetting or staining will indicate moisture and contamination.
- An electrolytic hygrometer having an indicator graduated in p/m on a range which is no greater than ten times the maximum specified moisture content.

ID NO.	QC INSPECTION	AMPLIFYING INFORMATION FROM DoD-STD-2138
C3 Cont'd	Clean Dry Air	<p>(d) A frost point analyzer in which the temperature of the viewed surface is measured at the time frost first begins to form.</p> <p>(e) A piezoelectric adsorption hygrometer on a range which is no greater than ten times the specified maximum range.</p> <p>Techniques (a) and (b) above are primarily for use in the field, and (c), (d), and (e) for shop monitoring instruments.</p>
C5	White Metal	<p>4.4.3.2 The blasted surface shall have a white metal blast appearance with an anchor-tooth (not peened) surface profile of 50 to 75 μm (2 to 3 mils) (see figure 3) and validated (measured) with profile tape and a dial micrometer. Blasting shall be done in accordance with SSPC No. 5. A white metal blast cleaned surface finish is defined as a surface with a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface, when viewed using a magnification of 10x, shall be free of oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint, or any other foreign matter. The color of the clean surface may be affected by the particular abrasive medium used. Photographic or other visual standards of surface preparation shall be used to further define the surface if specified in the contract. Abrasive blasted surfaces shall not be allowed to come in contact with contaminated surfaces prior to completion of metal spray and sealing processes. Prepared surfaces shall be handled only with clean gloves, rags, or slings. Contact with any oil or grease (such as touching with a bare hand) will result in failure of the coating. Blasting shall not be so severe as to distort the component being prepared for metal spray. The slightest presence of oil oxidation or other foreign material on the surface to be sprayed will result in separation of the metal spray coating.</p>
D3 and D23	<p>D. THERMAL SPRAYING (TS)</p> <p>Substrate Temperature and Dew Point Temperature</p>	<p>4.4.4.1 <u>Surface protection.</u></p> <p>..... If the steel or aluminum substrate temperature is not greater than 5°C (10°F) above the dew point, no metal spraying shall be conducted.....</p> <p>NOTE:</p> <p>D3: $\geq 5^{\circ}\text{C}$ (10°F) above dew point; ok to spray</p> <p>D23: $\leq 5^{\circ}\text{C}$ (10°F) above dew point; don't spray</p>

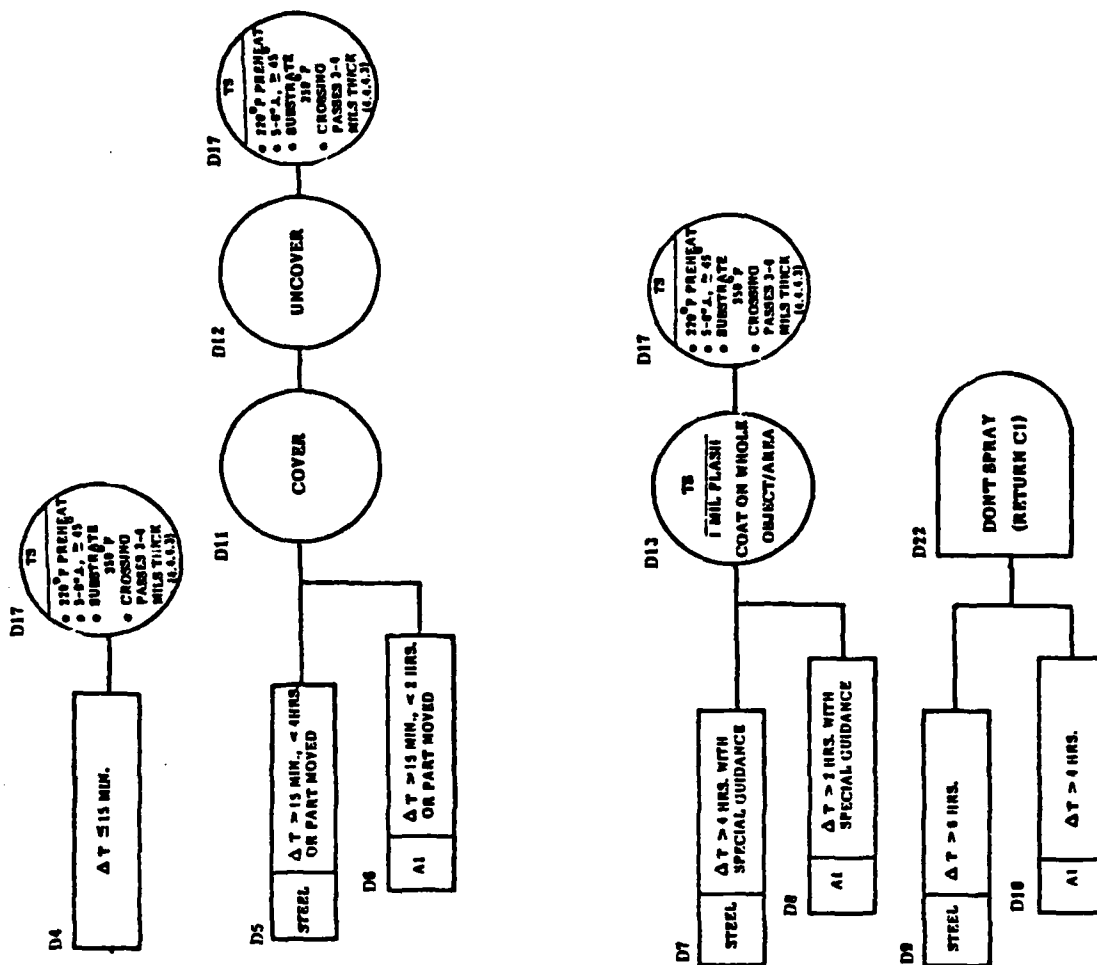
AMPLIFYING INFORMATION FROM DoD-STD-2138

QC INSPECTION

ID NO.

D4
thru
D10

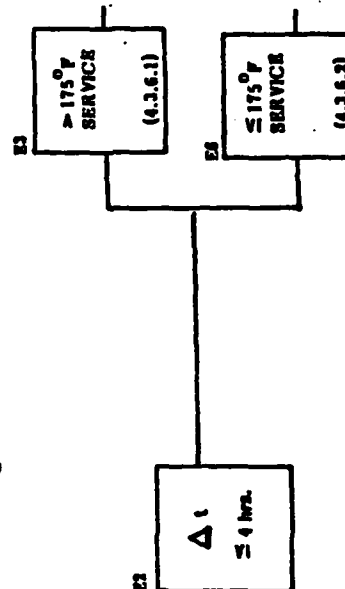
Permissible Time
Intervals Between
Completion of
Anchor-Tooth
Blasting and
Start/Completion
of TS



AMPLIFYING INFORMATION FROM DoD-STD-2138

ID NO.	QC INSPECTION	
D4 thru D10	Permissible Time Intervals Between Completion of Anchor-Tooth Blasting and Start/ Completion of TS	<p>4.4.4.1 <u>Surface protection</u>: The metal spray operation shall be started within 4 hours after anchor-tooth surface preparation for steel has been completed and shall be finished within 6 hours. The metal spray operation on aluminum shall be started within 2 hours after anchor-tooth surface preparation has been completed and shall be finished within 4 hours. If the steel or aluminum substrate temperature is not greater than 50°C (100°F) above the dew point, no metal spraying shall be conducted. If more than 15 minutes, but not over 4 hours is expected to elapse between the surface preparation and the start of the metal spray process, or if the part must be moved to another location, the prepared anchor-tooth surface shall be protected from moisture, contamination, and fingerprints. Wrapping with clean paper will normally provide adequate protection. When specified in the contract or other guidance documents, for periods longer than 4 hours, a flash coat of metal spray (at least 25 µm (1 mil)) shall be used to protect the surface until final metal spray can be applied. If the period exceeds 6 hours for steel or 4 hours for aluminum, or if other contamination or deterioration of the surface occurs, the surface shall be reblasted in accordance with 4.4.3.</p>
D18	Cross Passes 3-4 mils Thickness	<p>4.4.4.3 The metal coating shall be applied in multiple layers, and in no case shall less than two crossing passes, at right angles, be made over every part of the surface. The sprayed metal shall overlap on each pass of the gun to assure uniform coverage.</p>
D20	WSA Thickness	<p>10-15 mils for > 1750 service</p> <p>4.4.4.3 A type I coating system application for high temperature components (see 4.4.5, category I) shall consist of 250 to 375 µm (10 to 15 mils) of metal sprayed aluminum plus the appropriate seal coat (see 4.3.6.1).</p> <p>7-10 mils for ≤ 1750 service</p> <p>4.4.4.3 A type II coating system application for topside equipment (see 4.4.5, category II) and interior wet spaces (see 4.4.5, category III) shall consist of 175 to 250 µm (7 to 10 mils) of metal sprayed aluminum or zinc plus the appropriate seal coat (see 4.3.6.2).</p>

ID NO.	QC INSPECTION	AMPLIFYING INFORMATION FROM DoD-STD-2138
D21	Visual Examination	<p>5.3.3.1 Visual examination requirements. The metal sprayed coating prior to sealing shall have a uniform appearance. Surface defects of the metallized coating shall be limited to small nodules not to exceed 1.1 mm (0.045 inch) in diameter and shall not exceed 0.6 mm (0.025 inch) in height above the surrounding sprayed surfaces. The coating shall not contain any of the following:</p> <ul style="list-style-type: none"> (a) Blisters. (b) Cracks. (c) Chips or loosely-adhering particles. (d) Oil or other internal contaminants. (e) Pits exposing the undercoat or substrate.
E2 and E9	E. SEALING/TOPCOATING	<ul style="list-style-type: none"> No time specified between completion of wire spraying and start of sealing/painting. However, DoD-STD-2138(SH) Change 1 will specify a maximum time of 24 hours (concon with SEA 05M1, 6 Jun 85). CC Shop practice is ≤ 4 hours time interval and it is conservative in regards to the planned change.



ID NO.	QC INSPECTION	AMPLIFYING INFORMATION FROM DoD-STD-2138
E9 Cont'd		<div> <p>E10 NO VISUAL CORROSION PRODUCTS</p> <p>E11 ANY VISUAL CORROSION PRODUCTS</p> <p>E9 Δt > 4 hrs.</p> </div>
E3 and E5	<p>> 175° F Service Time (Between Coats) and Total Thickness 13-18 mils</p>	<p>4.4.4.5 Seal coat application. Seal coats used shall be dependent on the normal operating temperature of the component to be metal sprayed (see 4.3.6), and as specified (see 6.4). Two coats of 38 μm (1.5 mils) dry film thickness (dft) shall be applied as shown in figure 4 for type I system (see 4.3.6.1).</p> <div> </div> <p>4) WIRE-SPRAYED ALUMINUM - HIGH TEMPERATURE</p>

ID NO.	QC INSPECTION	AMPLIFYING INFORMATION FROM DoD-STD-2138
E10 and E11	No Visual Corrosion Products Any Visual Corrosion Products	<ul style="list-style-type: none"> • No specifications in DoD-STD-2138. • CC Shop practice is to inspect for visual corrosion products. <div> <pre> graph TD E3["E3 > 175°F SERVICE (4.3.6.1)"] --> E2["E2 ≤ 175°F SERVICE (4.3.6.2)"] E2 --> E10["E10 NO VISUAL CORROSION PRODUCTS"] E2 --> E11["E11 ANY VISUAL CORROSION PRODUCTS"] E11 --> E12["E12 DON'T SEAL GO TO CI"] </pre> </div>

SECTION V

OPERATOR TRAINING AND CERTIFICATION

5.1 TRAINING

SIMA CC Shop personnel shall be trained and certified for applying the WSA CC Systems 1 and 2 by completing the 10-day "CC Shop WSA Training/Certification Course." The course covers the theory and practical aspects of the prevention and control of corrosion with emphasis on the metallized coating systems; the detection, evaluation and repair of degraded metallized coating systems; the production of the wire sprayed aluminum (WSA) coating system (receipt inspection/item identification, surface preparation, masking, anchor-tooth blasting, thermal spraying and sealing/topcoating); quality control; record keeping; DoD-STD-2138(SH); this SIMA Process Instruction; and CC Shop operations (work stations and product flow, productivity and standard times, QC, consumables and supply support and installation kits). Approximately 1/3 of the time will be classroom training; 2/3 hand-on shop training in the SIMA CC Shop. Course completion and certification requires passing written examination and applying the WSA coating to test panels and test shapes in accordance with DoD-STD-2138.

The major training source documents are:

- DoD-STD-2138(SH) (Ref. B);
- NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems (Ref. E);
- Naval Reserve IMA-7 Training Program, Corrosion Control Using Wire-Sprayed Aluminum (Ref. D);
- Equipment Manufacture Operator and Field/Factory Maintenance Instructions; and
- This Process Instruction.

5.2 CERTIFICATION OF OPERATORS

Section 5.4 of DoD-STD-2138(SH) (Ref. B) applies; the applicable information is summarized below:

- **Certification Test Requirements**

(Test Panels: Four 2" x 3" x 0.050" wire sprayed 7-10 mils thick.)

- (1) **Visual Examination**

- a. Uniform appearance.

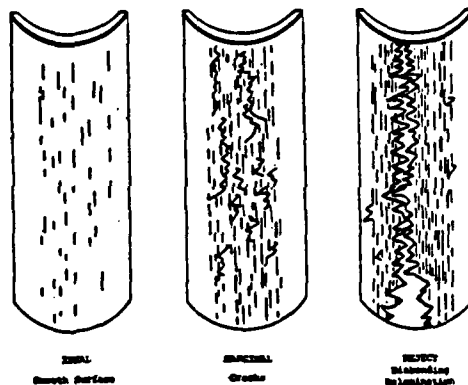
b. Small modules not to exceed 0.045" diam. by 0.025" high.

c. Complete absence of

Blisters,
Cracks,
Chips or loosely-adhering particles,
Oil or other internal contaminants, and
Pits exposing the undercoat or substrate.

(2) Bend Test

- Bend sprayed panels 180° on a 1/2" diameter rod with WSA coating on the outer radius.
- Visual examination for no disbonding, delamination or gross cracking of the coating shall occur due to bending. Small hairline cracks or alligating of the coating in the vicinity of the bend are permissible. Acceptable and non-acceptable bend test results are illustrated below:

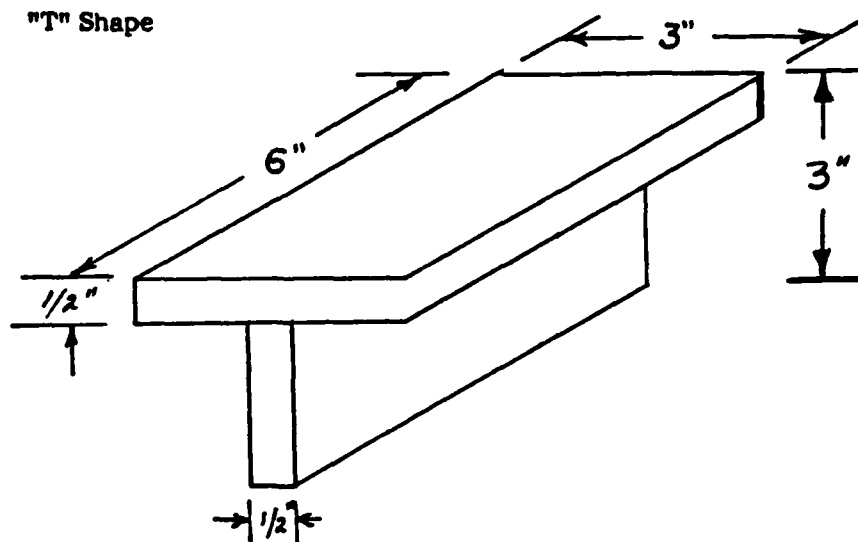


(3) Bond Test

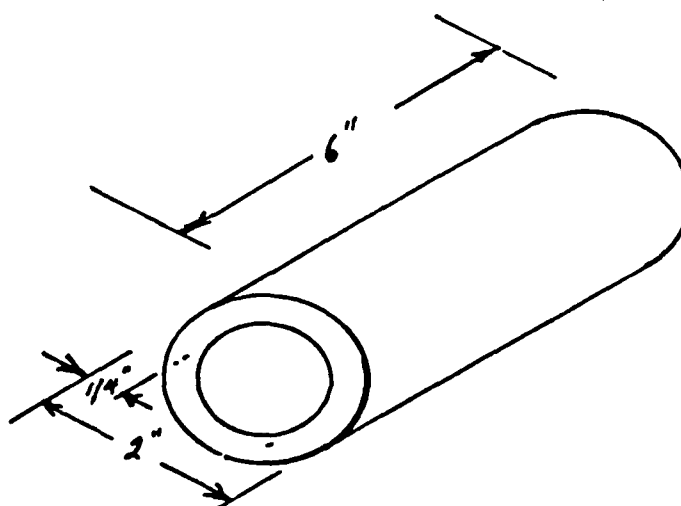
- The bond test of five 1" diam. x 1" long steel fixtures conducted in accordance with ASTM C633 (see Appendix A) must have an average tensile greater than 2000 psi with no tensile less than 1500 psi.
- The ASTM 633 test requires a minimum WSA coating thickness of 15 mils "because an adhesive bonding agent is used in the test...and tend to penetrate flame-sprayed coatings and may invalidate results unless the coating thickness are thick enough to prevent penetration through the coating." It is pointed out however, that 7-mil WSA coating thickness has been demonstrated to be a non-through, porosity thickness by NAVSSES circa 1979.

(4) **Shape Test**

- **"T" Shape**



- **"Pipe" Shape**



- The "T" and "pipe" shapes must be coated with 7-10 mils WSA and pass the coating thickness and visual examination.

SECTION VI

METHOD

The method for applying the WSA CC Systems 1 and 2 is given in Figure 3, Production Flow Chart. The spraying parameters for the METCO 10E, 11E and 12E flame-spray guns are given in Blocks D15 and D16 amplifying information for the Production Flow Chart. The Production Flow Chart specifies all the major operations, inspections and movement or transportation of the items being preserved with the WSA systems. The major production events identified by their Production Flow Chart number for the five phases follows:

ID NO.	PRODUCTION OPERATION	AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)
A. SURFACE PREPARATION		
A1	Clean Substrate	No contamination or oxidation.
A2	Solvent Clean	4.4.1.1 Solvent cleaning. Prior to any masking, blasting, or spraying, surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with 4.3.1. Cleaning may be done by wiping, brushing, or spraying. Precautions shall be taken to protect any parts which may be attacked by the solvents.
A3	TSP Wash	4.4.1.2 Contaminated surfaces. Surfaces shall be cleaned with a trisodium phosphate solution, rinsed with clear, potable water, and dried after solvent cleaning.
A4	Abrasive Cleaning	4.4.1.3 Abrasive cleaning. Preliminary abrasive blast cleaning may be used to remove heavy or insoluble deposits. An inexpensive, disposable abrasive is recommended. Dust and debris shall be removed by dry compressed air "blow off" prior to anchor-tooth blasting.
A5	Heat Cleaning	4.4.1.4 Heat cleaning. Porous materials that have been contaminated with grease or oil shall be solvent cleaned (see 4.4.1.2). If required, parts shall be heated in vented electric ovens for at least 4 hours to remove grease or contamination remaining after degreasing cleaning process. Steel alloys may be heated to 315°C (600°F) maximum. Aluminum alloys, except age-hardened alloys, may be heated to 150°C (300°F) maximum.
A6	Clean Substrate	No contamination or oxidation.
B. MASKING		
B1	TRANSPORT TO MASKING AREA	
B2 and B3	Mask	4.4.2 Masking. Masking shall be performed on all adjacent areas which may be affected by abrasive blasting or metal spraying. The mask (tape) shall be applied tightly enough to prevent grit from seeping under the mask. Two layers of tape shall be applied with the second layer at right angles to the first. Protective masking shall be inspected for damage between the abrasive and metal spray processes and replaced if damaged.

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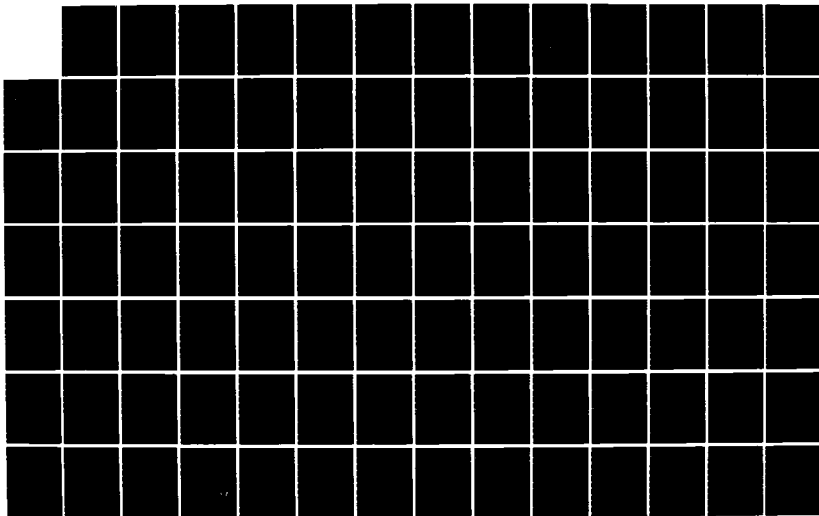
CORROSION-CONTROL (CC) PROGRAM SIMA (SHORE INTERMEDIATE 2/5
MAINTENANCE ACTIV. (U) INTEGRATED SYSTEMS ANALYSTS INC
NATIONAL CITY CA W ADKINS ET AL 30 NOV 85

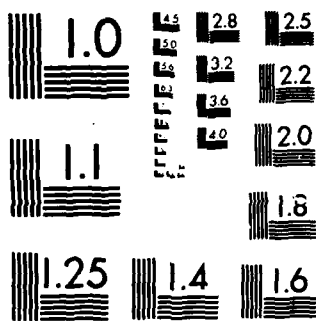
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

ID NO.	PRODUCTION OPERATION	AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)
B2 and B3 Contd	Proper Masking	<p>4.4.2.1 Special requirements. When a machinery component is not to be disassembled, working and threaded surfaces shall be masked. Unless otherwise noted on applicable drawings for specific surfaces, the following surfaces shall be properly masked or plugged to prevent their being damaged by abrasive blasting or sprayed metal coating:</p> <ul style="list-style-type: none"> (a) Machined surfaces that are required to move with respect to each other, such as threads, bearing seats, gear teeth, and slides. (b) Surfaces related to component alignment, proper seating, and mounting, such as flange faces, counterbores, and keyways. (c) Electrical assemblies, such as contacts, relays, and insulators.
	C. ANCHOR-TOOTH BLASTING	
C1	TRANSPORT TO	ANCHOR-TOOTH BLASTING STATION
C2	Al ₂ O ₃ Quantity	<p>4.4.3.1 Aluminum oxide or angular chilled iron grit (see 4.3.3) shall be used for the final surface preparation of the substrate. Only aluminum oxide may be reused for anchor-tooth blasting. Prior to reuse, the aluminum oxide shall be screened using a 30-mesh screen, visually inspected for debris and oil contamination, and shall pass the following oil contamination test:</p> <ul style="list-style-type: none"> (a) Fill a clean 150 milliliter (5-ounce) vial or bottle half full of screened abrasive particles. (b) Fill the remainder of the vial or bottle with clean water. (c) Cap and shake vial or bottle. (d) Inspect water for oil sheen. (e) If any oil is observed, the abrasive particles shall not be used in the final anchor-tooth blasting process. (f) Clean blasting equipment, replace blasting material, and retest.
C3	Clean Dry Air	<p>4.2.1.2 Abrasive Blasting process shall utilize air having a maximum permissible contamination value of five MG condensed hydrocarbons per cubic meter of air output.</p> <p>4.2.2.2 Air equipment. The air equipment used in the metal spraying system shall furnish air which is free of oil and moisture (less than 0.03 p/m oil). For the metallizing operation, a pressure of at least 415 kPa (60 lb/in²) shall be available at the air control unit. There shall be not more than 11 meters (a) (35 feet) of 10 mm (3/8 inch) inside diameter (i.d.) hose between the air control unit and the wire spray gun. Each metal spray outfit shall consist of all components and accessories listed in table 1.</p>

AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)

TABLE 1. Equipment and quantity.

Equipment	Quantity	
	Class 8	Class 10
Metallizing gun, complete with lubricants, carry case, tool set, and manuals	1	1
Air caps	2	2
Wire nozzles	2	2
Nose set, complete	1	1
Regulator, oxygen	1	1
Regulator, fuel gas	1	1
Flowmeter, oxygen	1	1
Flowmeter, fuel gas	1	1
Flowmeter, air	1	1
Control unit	1	1
Wire reel and stand	1	1
Wire straightener	1	1
Gun mounting fixture	1	1

C3 Clean Dry Air

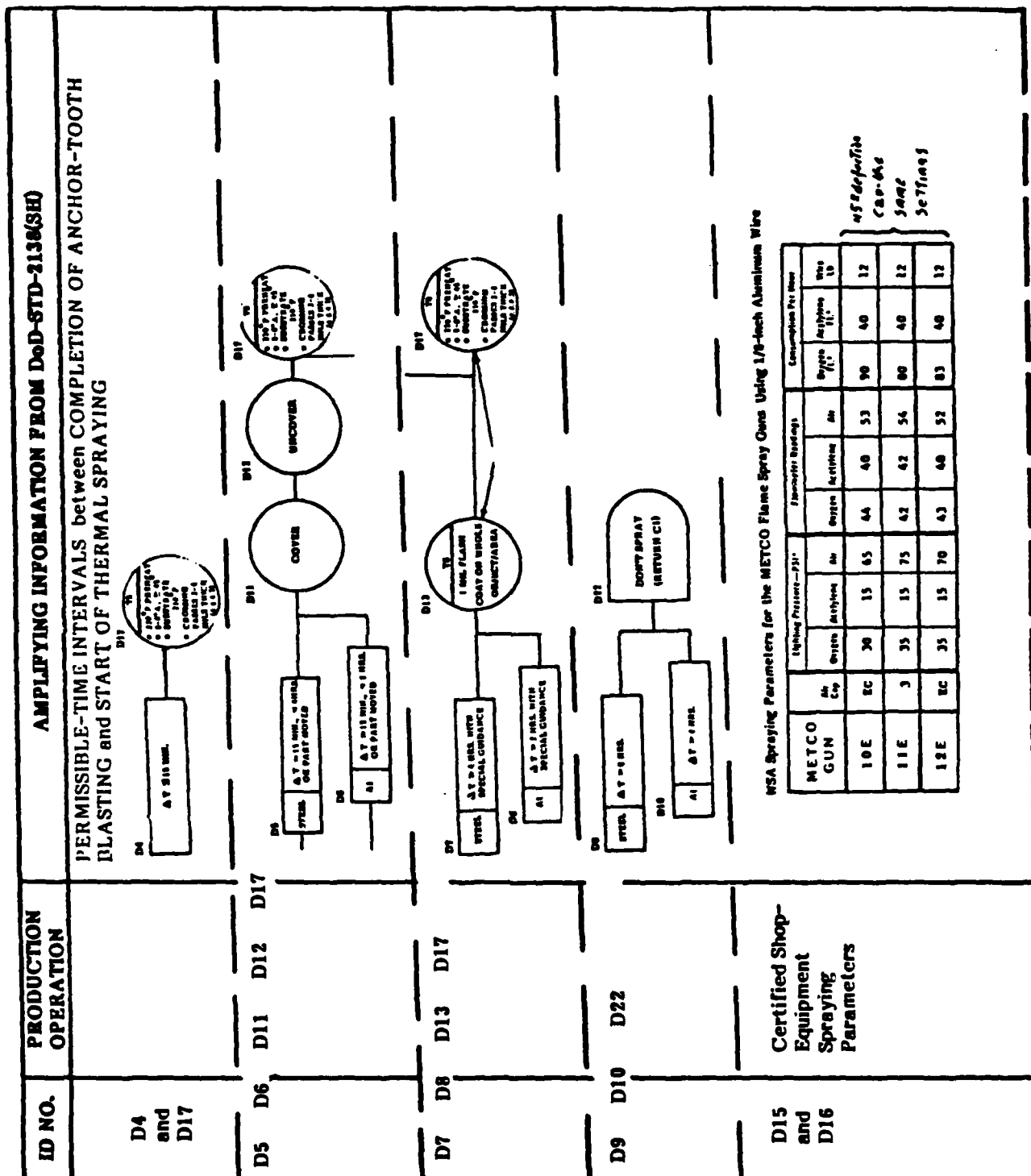
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4.2.2.3 Air quality. In-line water and oil filters shall be located between the compressor and the metal spray equipment. These filters shall be periodically inspected and serviced to assure delivery of uncontaminated dry air. When greater control is required, automatic dew point measuring instruments with feedback to control the quality of air shall be installed. Optional equipment may be required as specified in the contract for special applications in accordance with MIL-M-3800.

4.4.4.2 Air quality. Any of the following procedures and equipment may be used to monitor water content of the compressed air:

- Open a valve downstream of the filter/dryer components slightly, allowing air to vent with a slightly audible flow into an open dry container for 1 minute. Any wetting or staining will indicate moisture or contamination.
- Repeat (a) above using a clean white cloth. Any wetting or staining will indicate moisture and contamination.
- An electrolytic hygrometer having an indicator graduated in p/m on a range which is no greater than ten times the maximum specified moisture content.

ID NO.	PRODUCTION OPERATION	AMPLIFYING INFORMATION FROM DoD-STD-2136(SH)
C4 and C5	Anchor-Tooth Blast and White Metal	<p>4.4.3.2 The blasted surface shall have a white metal blast appearance with an anchor-tooth (not panned) surface profile of 50 to 75 μm (2 to 3 mils) (see figure 3) and validated (measured) with profile tape and a dial micrometer. Blasting shall be done in accordance with SSPC No. 5. A white metal blast cleaned surface finish is defined as a surface with a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. The surface, when viewed using a magnification of 10X, shall be free of oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint, or any other foreign matter. The color of the clean surface may be affected by the particular abrasive medium used. Photographic or other visual standards of surface preparation shall be used to further define the surface if specified in the contract. Abrasive blasted surfaces shall not be allowed to come in contact with contaminated surfaces prior to completion of metal spray and sealing processes. Prepared surfaces shall be handled only with clean gloves, rags, or slings. Contact with any oil or grease (such as touching with a bare hand) will result in failure of the coating. Blasting shall not be so severe as to distort the component being prepared for metal spray. The slightest presence of oil oxidation or other foreign material on the surface to be sprayed will result in separation of the metal spray coating.</p>
C6	Cover to Transport or Limited Storage	<p>4.4.4.1 <u>Surface protection.</u> If more than 15 minutes, but not over 4 hours is expected to elapse between the surface preparation and the start of the metal spray process, or if the part must be moved to another location, the prepared anchor-tooth surface shall be protected from moisture, contamination, and fingerprints. Wrapping with clean paper will normally provide adequate protection.</p>
	D. THERMAL SPRAYING (TS)	
D1	TRANSPORT TO TS BOOTH	
D2	Measure Dew Point	<p>4.4.4.1 <u>Surface protection.</u> If the steel or aluminum substrate temperature is not greater than 5°C (10°F) above the dew point, no metal spraying shall be conducted....</p> <p>NOTE: D3: $> 5^{\circ}\text{C}$ (10°F) above dew point; ok to spray D23: $\leq 5^{\circ}\text{C}$ (10°F) above dew point; don't spray</p>
D3 and D23	Substrate Temp. and Dew Point Temp.	<pre> graph TD D2[D2 SUBSTRATE TEMPERATURE > 5°C (10°F) above dew point] --> D3[D3 SUBSTRATE TEMPERATURE > 5°C (10°F) above dew point; ok to spray] D3 --> D23[D23 SUBSTRATE TEMPERATURE ≤ 5°C (10°F) above dew point; don't spray] D23 --> D23_Box[DON'T SPRAY (RETURN C1)] </pre>



AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)

ID NO. PRODUCTION OPERATION

D15 and D16
Contd

1-ft Flame-Spray Extension

METCO GUN	Air Cap	Liquid Priming - 10"		Flame-Spray Extension		Consumption Per Hour	
		Oxygen	Acetylene	Air	Oxygen	Acetylene	Air
10E	EC 27	1/4	5/8	40	36	51	90
12E	EC 35	15	75	40	36	51	90

o Visual

5.3.3.1 Visual examination requirements. The metal sprayed coating prior to sealing shall have a uniform appearance. Surface defects of the metallized coating shall be limited to small nodules not to exceed 1.1 mm (0.045 inch) in diameter and shall not exceed 0.6 mm (0.025 inch) in height above the surrounding sprayed surfaces. The coating shall not contain any of the following:

- (a) Blisters.
- (b) Cracks.
- (c) Chips or loosely-adhering particles.
- (d) Oil or other internal contaminants.
- (e) Pits exposing the undercoat or substrate.

o Thickness

4.4.5 Approved applications of metal spray coatings for corrosion control.

Category I - machinery space components:

(a) Aluminum coating 250 to 375 μ m (10 to 15 mils) thick:

Category II - topside weather equipment:

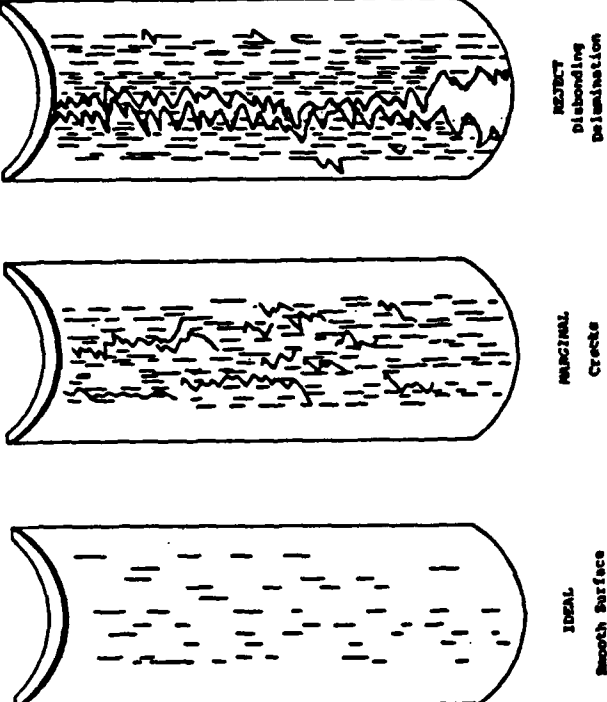
(a) Aluminum or zinc coating - 175 to 250 μ m (7 to 10 mils) thick.

Category III - interior wet spaces:

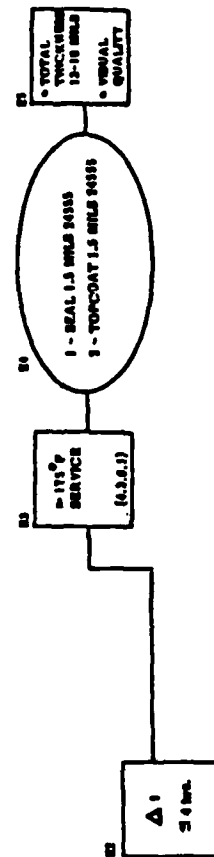
(a) Aluminum or zinc coating - 175 to 250 μ m (7 to 10 mils) thick:

o Bend

5.3.3.2 Bend test. No disbonding, delamination, or gross cracking of the coating shall occur due to bending. Small hairline cracks or alligatoring of the coating in the vicinity of the bend are permissible. Figure 6 illustrates acceptable and nonacceptable bend test results.

ID NO.	PRODUCTION OPERATION	AMPLIFYING INFORMATION FROM DOD-STD-2130(SH)
D14 Contd		 <p>FIGURE 6. Coupon bend test accept/reject examples.</p>
D18	Crossing-Pass Thickness 3-4 mils	<p>4.4.4.3</p> <p>The metal coating shall be applied in multiple layers, and in no case shall less than two crossing passes, at right angles, be made over every part of the surface. The sprayed metal shall overlap on each pass of the gun to ensure uniform coverage.</p>
D19	TS - Completion Time	<p>4.4.4.1 Surface protection. The metal spray operation shall be started within 4 hours after anchor-teeth surface preparation for steel has been completed and shall be finished within 6 hours. The metal spray operation on aluminum shall be started within 2 hours after anchor-teeth surface preparation has been completed and shall be finished within 4 hours.</p>

ID NO.	PRODUCTION OPERATION	AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)
D20 and D21	WSA Thickness and Visual Examination	<p>10-15 mils for ≥ 1750 service</p> <p>A type I coating system application for high temperature components (see 4.4.5, category I) shall consist of 250 to 375 μm (10 to 15 mils) of metal sprayed aluminum plus the appropriate seal coat (see 4.3.6.1).</p> <p>7-10 mils for ≤ 1750 service</p> <p>A type II coating system application for topside equipment (see 4.4.5, category II) and interior wet spaces (see 4.4.5, category III) shall consist of 175 to 250 μm (7 to 10 mils) of metal sprayed aluminum or zinc plus the appropriate seal coat (see 4.3.6.2).</p>
D25	PROTECT FOR	TRANSPORT/QUEUING AS REQUIRED
E1	E. SEALING/TOPCOATING	TRANSPORT TO PAINTING STATION
E2 E3 E4 E5	Heat-Resistant-Aluminum Sealer and Topcoat	<p>No time specified between completion of wire spraying and start of sealing/painting. However, DoD-STD-2138(SH) Change 1 will specify a maximum time of 24 hours (concomitant with SEA 85M1, 6 Jun 85).</p> <p>CC Shop practice is ≤ 4 hours time interval and it is conservative in regards to the planned change.</p>



AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)

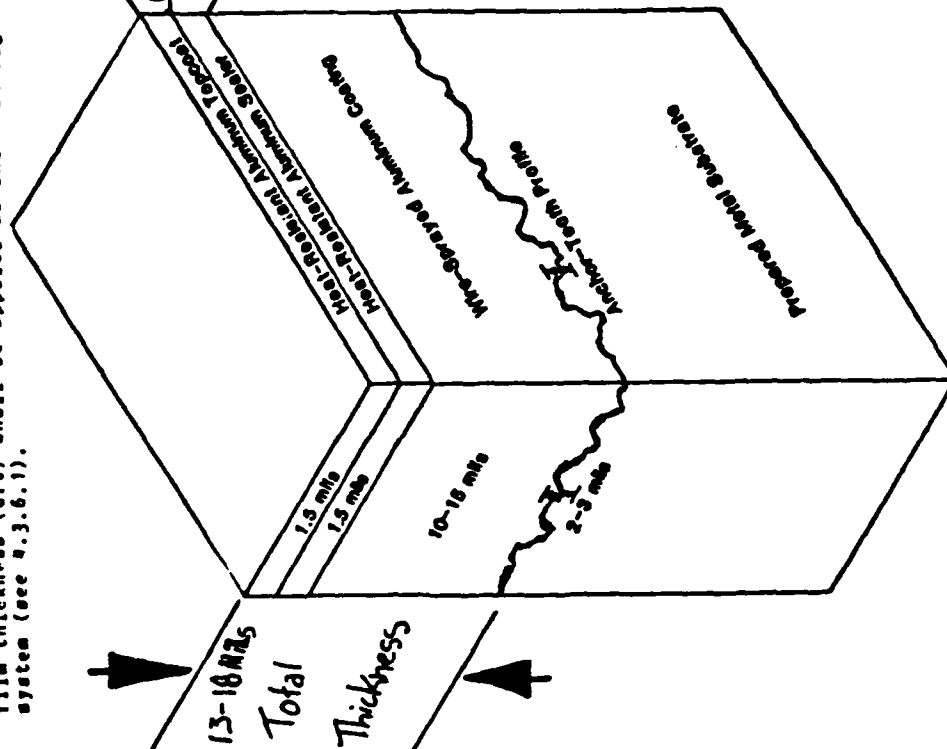
ID NO. PRODUCTION OPERATION

E2 E3 E4 E5

Contd

4.4.4.5 Seal coat application. Seal coats used shall be dependent on the normal operating temperature of the component to be metal sprayed (see 4.3.6), and as specified (see 6.4). Two coats of 30 µm (1.5 mils) dry film thickness (dft) shall be applied as shown in figure 4 for type I system (see 4.3.6.1).

Coat	Time	After
2nd (Topcoat)	24 hrs	1st
1st (Primer)	≤ 4 hrs	WKA



a) WIRE-SPRAYED ALUMINUM - HIGH TEMPERATURE

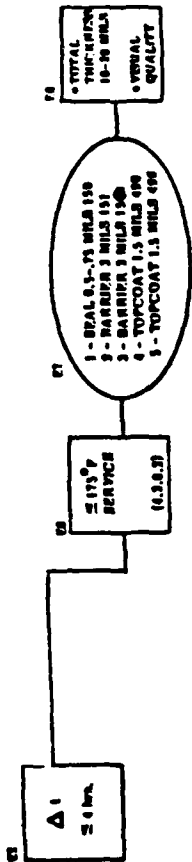
AMPLIFYING INFORMATION FROM DoD-STD-2138(SH)

ID NO. PRODUCTION OPERATION

E2 E6 E7 E8 Epoxy-Polyamide

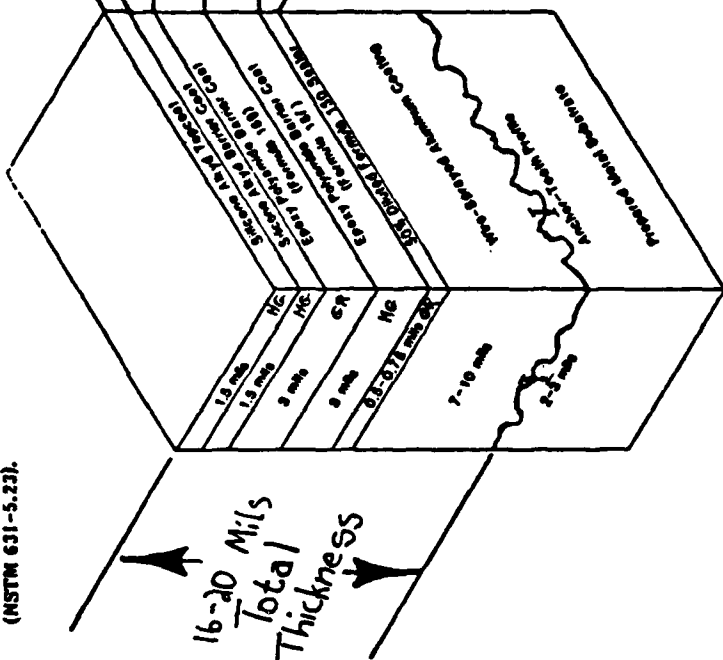
Silicone-Alkyd

5-Coat Schedule

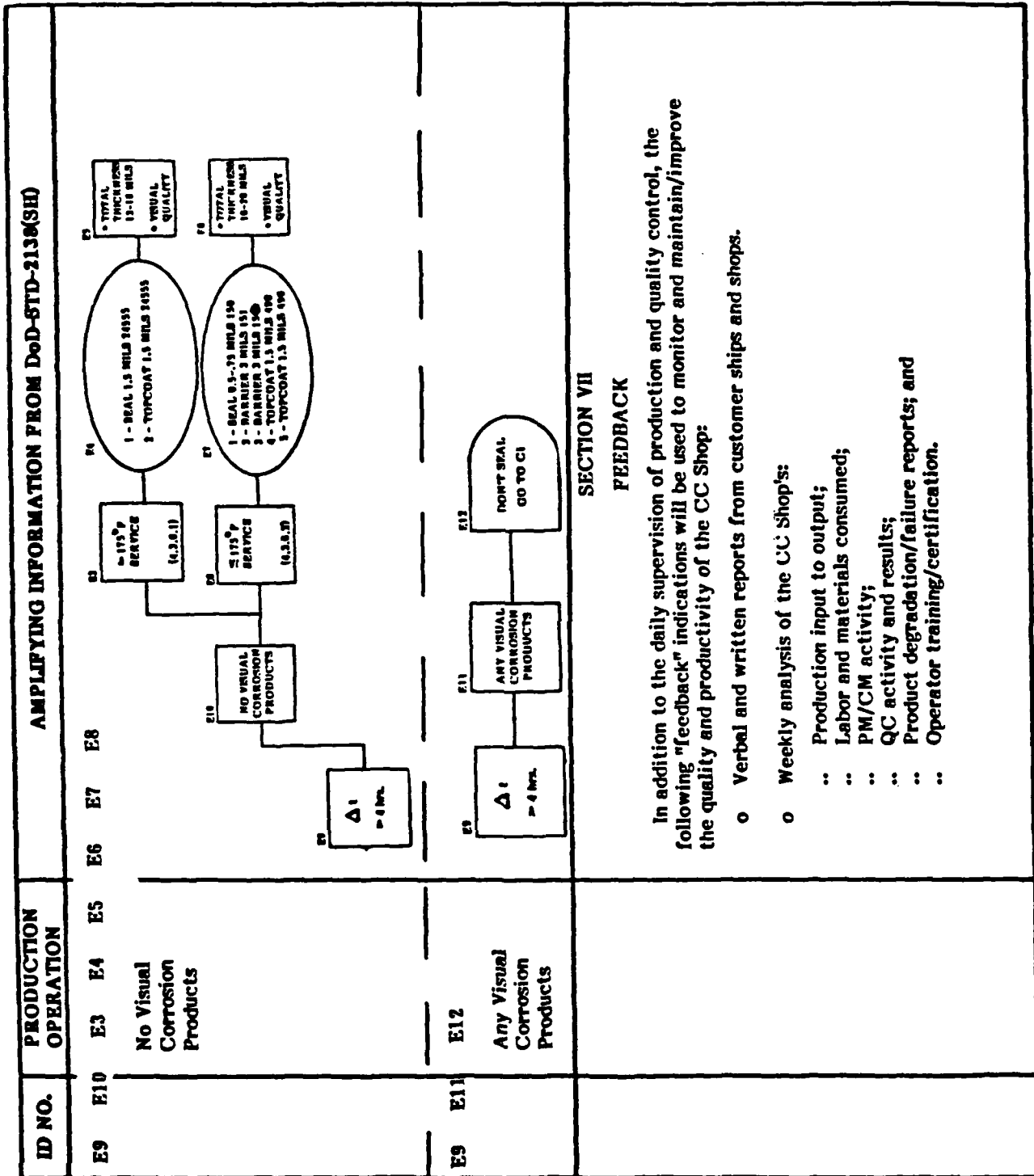


4.4.4.5 and SCCA 6-83. The seal coat for Type II system shall be a coat of dilute epoxy primer MIL-P-2441A, (thinned 50% by volume with TGM TT-R-781), 13 to 19 um (0.50 to 0.75 mil) Formula 150 dft; a coat of Formula 151 point 50 to 75 um (2 to 3 mils) dft; a coat of Formula 150 paint 50 to 75 um (2 to 3 mils) dft; and a color top coat as required for the area. Note: The color change in the first four coats is used to aid in the proper application and coverage (NSTM 631-5.23).

COAT	TIME	Alter
5th	~24 hrs	4th
2nd Topcoat	7 days	3rd
1st Topcoat	4-8 hrs	2nd
2nd Barrier	>857 hrs	1st
2nd Barrier	>857 hrs	1st
1st Barrier	>857 hrs	1st
Primer	≤ 4 hrs	WSA



WIRE-SPRAYED ALUMINUM - LOW TEMPERATURE



SECTION VII FEEDBACK

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

- o Verbal and written reports from customer ships and shops.
- o Weekly analysis of the CC Shop's:
 - .. Production input to output;
 - .. Labor and materials consumed;
 - .. PM/CM activity;
 - .. QC activity and results;
 - .. Product degradation/failure reports; and
 - .. Operator training/certification.



APPENDIX A4-3
TIME STANDARD DEVELOPMENT
for
THE APPLICATION OF WIRE-SPRAYED-ALUMINUM (WSA) COATINGS
ON TOPSIDE SHIPBOARD COMPONENTS

1.0 INTRODUCTION

Standard times are required by the Planning Department to correctly schedule CC work and load the shop based upon what the operator can reasonably perform. Standard times are defined as the times required by an average operator, who has been fully trained to handle the work assignment and who is working at a normal pace, to perform the operation. It is essential that these allowed times are realistic for full-time production. Realistic allowances for personal needs, unavoidable delays and general slowdown of performance because of fatigue, etc., must be included in the development of these standard times.

The collection of standard times was a major concern of the Pilot CC-Shop Service Test since the beginning of production. It was desired to measure standard times on all representative items that would be serviced by a SIMA CC Shop. Forms used to record element times were developed and modified as improvements became apparent. Due to the nature of work performed by the CC Shop, it was necessary to determine the process element times for each type and size of component.

2.0 METHODOLOGY

2.1 Process Chart and Record System

The SIMA Process Instruction No. 7100-18-84 Rev 1 (25 October 1985) for the application of WSA details the IPE, materials, safety, quality control, operator training and certification and methods used by the CC Shop (Ref. A4-3-1). The Production-Flow Chart (Figure 3 of the SIMA Process Instruction (Appendix A3-1-1) and Figure A4-3-1 of this Appendix) summarizes all of the operation, transportation, inspection and delays in the method. For standard-time measurements, the production process was divided into production elements. A production element is a division of work that has identifiable terminal points and can be time measured. The Production-Flow Chart (Figure A4-3-1) was simplified to show the specific operations for which time measurements were made into the standard-time-measurement WSA operation-process chart (Figure A4-3-2). This chart includes only operation and inspection elements. These elements then became the basis for a Production-Control Record (Figure A4-3-3) which has evolved through various modifications to simplify the data collection.



Figure A4-3-1 Production-Flow Chart for Wire-Sprayed-Aluminum Coating

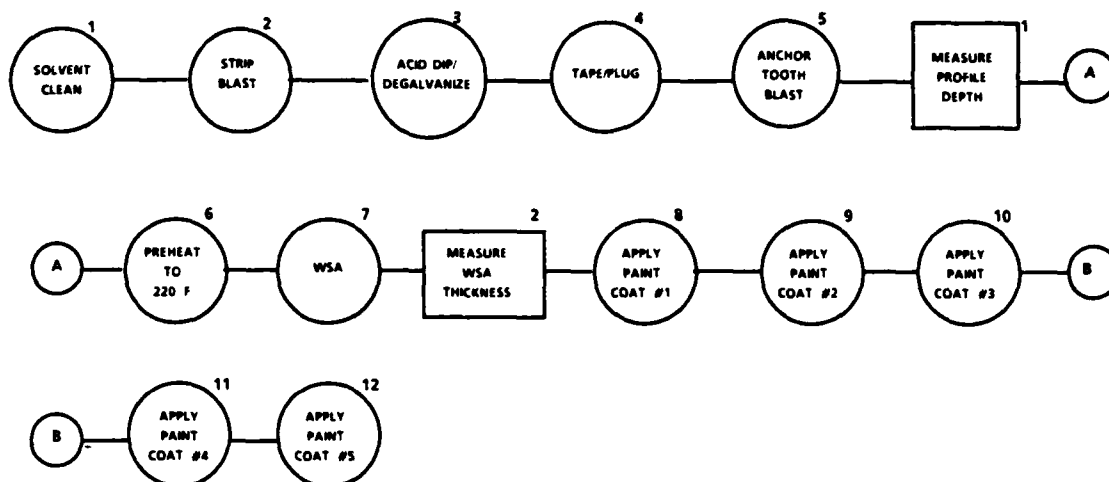


Figure A4-3-2 Standard-Time-Measurement WSA Operation-Process Chart

2.2 Samples, Sample Size and Data Collection

Time-standards were developed for all representative items that would be serviced by a SIMA CC Shop, i.e., actual work load from customer ships, specific items pulled from ships that were not in the Pilot Shop routine work package and items cited in the ship-class CC manuals. One-hundred eleven item class samples were measured with sample size ranging from one to 243.

Utilizing the Production-Control Record and a stopwatch, times to complete each operation process element were recorded by a designated Shop Petty Officer. This collection commenced with the start of production and was performed for every component processed by the shop. This method had its shortcomings. As the shop workload increased, the Petty Officer's colateral duties increased and it became impossible to time each element of each component's production. The forms were found to be completed by the Petty Officer's best guess or the operator's estimate of the time expended. These values were deemed approximate times due to the experience of the record keeper and did correspond to actual element times audited in most cases.

In order to remedy the non-measurement values obtained from shop personnel, a Petty Officer from the Time-and-Motion Study group was assigned to the shop to take the measurements. Once again, this method failed to record all values due to production occurring at various stations simultaneously. Another problem occurring was the change of the department head which resulted in the change of department measuring policy. The original policy was to record values to the nearest 15-minute interval. The new policy was to record actual times, however, apparently this upset the normal collection and evaluation methods also involved.

CORROSION CONTROL SHOP SHIPCHECK/PRODUCTION CONTROL RECORD																																																																																																																											
USS _____ Name _____ Type Number _____ PHONE # _____				SHIP CC COORD _____ ALTERNATE _____																																																																																																																							
ITEM DESCRIPTION _____ ITEM LOC. _____ Deck Frame Side _____ QTY _____ SHIP PRI # _____ APPROX WT Bld _____ Additional Info on Reverse Side _____				<div style="display: flex; justify-content: space-between;"> <div> TYPE COATING _____ FINISH COLOR: _____ _____ WSABT _____ HAZE GRAY _____ BLACK _____ WSALT _____ DECK GRAY _____ RED _____ POWDER _____ WHITE _____ IRAP _____ </div> <div> <div style="border: 1px solid black; padding: 2px;"> WASA PRODUCTION DATA (Milestones) PROCESS SEQUENCE _____ TIME _____ OPER _____ </div> <div> SURFACE STRIP BLAST _____ PREP ACID DIP _____ DEGALVANIZE _____ MASKING TAPE _____ PLUG _____ ANCHOR-TOOTH _____ TOOTH PROFILE DEPTH _____ PREHEAT TO 220F _____ THERMAL SPRAY _____ WASA DEPTH _____ 2 COATS HRAP _____ 150 - 0.5-0.75 ml _____ 151.3 ml BARRIER _____ 150.3 ml BARRIER _____ 490 - 1.5 ml TOP _____ 490 - 1.5 ml TOP _____ </div> </div> </div>																																																																																																																							
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SHIP RELEASE _____ Signature _____ Date _____				<div style="display: flex; justify-content: space-between;"> <div> NAVSEA CC SYSTEMS 5 NON-SKID DECK COATING 6 CERAMIC COATING 7 WATER-DISPLACING COMPOUND 8 ANTI-SEIZE COMPOUND 9 IMPROVED FASTENERS 10 SEALING & COATING COMPOUND 11 POLYSULFIDE SEALANT 12 PROTECTION OF FLEC CORR 13 DIELECTRIC BARRIER 14 VAPOR-PHASE INHIBITOR 15 STRIPPABLE COATINGS </div> <div> RECD: NED </div> </div>																																																																																																																							
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A4-3-4

Figure A4-3-3 Production-Control Record (Rev. 4)

Due to time limitations at this point, an ISA employee was assigned the part-time duty of timing production periods. These values were to be used as an independent sample to be included with the shop values which corresponded to a high degree in many cases.

It was also realized that the components listed in the NAVSEA Ship-Class CC Manuals, which is the component selection guide, that were not processed through the CC Shop would need to be included in the planning package. Operation process-element times for these components were estimated on the basis of experience and the element times collected for similarly sized and shaped components.

This data is compiled in Table A4-3-1, and the mean operation process-element times are summarized in Table A4-3-2.

2.3 Data Adjustment

In order to create realistic process times, adjustments for the following factors were considered:

- transportation between stations
- operator performance
- personal allowances
- basic-fatigue allowance
- abnormal-position allowance
- muscular energy required
- lighting allowances
- atmospheric allowances
- noise level
- station preparation and set-up
- pilot-shop allowance
- planning requirements

2.3.1 Transportation

Due to the many simultaneous processes occurring, the transportation between stations was not recorded. This time is significant in the standard-time development and must be accounted for. This factor will be included in the Pilot-Shop Production-Allowance Factor (PPAF) in Section A4.2.3.11.

2.3.2 Operator Performance

In the collection of element times, the operator experience level ranged from trainee to journeyman. Due to continual personnel turnover, the recorded shop mix is considered typical, and therefore no additional allowances are deemed applicable.

Text continues on pg. A4-3-49

Table A4-3-1 Process-Element Times

Chain Bar																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR
DD-992	5015		Z5			30	1	4	10	1	1	1	1	1	1	76 1.3
DD-992	5016		Z5			35	1	9	15	1	2	2	2	2	2	96 1.6
Average		0.0	Z5.0	0.0	0.0	32.5	1.0	6.5	12.5	1.0	1.5	1.5	1.5	1.5	1.5	86.0 1.4
Buster Bolt																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
D06-15	4351		5			5	1	4	4	1	1	1	1	1	1	30 0.5
Average		0.0	5.0	0.0	0.0	5.0	1.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	30.0 0.5
J-Bolt																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
FFB-Z5	5056	2	10			10	1	2	4	1	1	1	1	1	1	40 0.7
Average		2.0	10.0	0.0	0.0	10.0	1.0	2.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	40.0 0.7
Accommodation Ladder Brace																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR
FFB-Z5	5057		Z0			10	2	4	7	1	3	4	4	3	3	60 1.0
FFB-Z5	5057		Z0			10	2	4	7	1	3	4	4	4	4	75 1.3
FFB-Z5	5057		Z5			12	2	5	9	1	4	3	3	3	3	70 1.2
FFB-Z5	5058		Z0			10	2	4	10	1	3	3	3	3	3	62 1.0
FFB-Z5	5058		Z0			10	2	4	20	1	3	3	3	3	3	72 1.2
			15			20	1	1	16	1	5	4	4	4	4	75 1.2
			Z2			20	3	5	26	1	4	5	5	5	5	111 1.9
Average		0.0	Z1.7	0.0	0.0	13.1	2.0	3.9	13.6	1.0	3.8	3.7	3.6	3.6	3.6	74.9 1.2

Table A4-3-1

Floodlight Bracket (Plate) (Cont'd)

Floodlight Bracket with Pipe

Table A4-3-1

Helpo Net Securing Bracket

Answer 202

1978-1979

Answer 202

Sliding Paper Bracket

April 1968

Process-Element Times (cont'd)

Director Counterweight

Table A4-3-1 Process-Element Times (cont'd)

Director Counterweight - Cylindrical																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
D06-15	4334		32			27	2	17	47	1	7	8	9	8	9	167	2.8
D06-15	4334		27			25	2	15	45	1	6	6	7	6	7	151	2.5
Average		0.0	29.5	0.0	0.0	26.0	2.0	16.0	46.0	1.0	7.5	7.0	8.0	8.0	8.0	159.0	2.7

Pipe Coupling																		
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR	
44		5	10			8	6	1	3	5	1	2	2	2	2	2	49	0.8
Average		5.0	10.0	0.0	0.0	8.0	6.0	1.0	3.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	49.0	0.8

INC Speaker Cover																		
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR	
6			20			5	12	1	2	20	1	8	4	4	4	5	86	1.4
Average		0.0	20.0	0.0	0.0	5.0	12.0	1.0	2.0	20.0	1.0	8.0	4.0	4.0	4.0	5.0	86.0	1.4

BOWS Cable Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
FF-1045	5182	5	10			15	3	3	34	3	10	8	7	7	7	112	1.9
FF-1045	5182	5	5			4	3	3	5	3	2	2	2	2	2	37	0.6
FF-1045	5183	5	5			6	1	2	10	2	2	2	2	2	2	41	0.7
FF-1045	5183	5	15			10	2	2	21	2	10	12	12	8	4	103	1.7
FF-1045	5183	5	5			9	3	2	12	2	5	3	3	2	2	53	0.9
FF-1045	5183	5	5			6	2	3	16	2	3	3	4	3	6	61	1.0
FF-1045	5183	5	7			15	3	3	25	2	5	2	10	11	11	99	1.7
FF-1045	5183	5	20			30	3	3	30	2	7	16	13	10	10	144	2.4
FF-1045	5183	5	5			10	2	2	15	2	3	4	3	2	5	58	1.0
FF-1045	5183	5	5			4	3	3	5	1	2	2	2	2	2	27	0.5
FF-1045	5183	5	6			8	3	2	13	1	3	4	4	4	4	52	0.9
FF-1045	5183	5	7			10	2	2	16	1	10	12	12	11	12	95	1.6
FF-1045	5183	5	5			9	1	1	12	1	3	4	4	4	4	48	0.8
FF-1045	5183	5	19			15	3	3	34	1	10	16	15	15	15	148	2.5
Average		3.2	8.4	0.0	0.0	10.8	2.4	2.2	17.6	1.6	5.4	6.5	6.6	5.9	6.3	77.0	1.3

Table A4-3-1 Process-Element Times (cont'd)

Chain Locker Cover																		
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR	
DDE-15	4360	10	30			15	1	1	5	25	1	9	10	10	10	10	134	2.2
DDE-15	4360	10	30			20	1	5	5	27	10	10	10	10	10	10	144	2.4
DD-972	5074	10	40			42	2	10	47	47	5	5	6	5	5	5	178	3.0
DD-972	5074	10	40			42	2	10	47	47	5	5	6	5	5	5	178	3.0
FF-25	5057		70			35	3	10	23	23	1	3	3	5	5	5	168	2.8
FF-1065	5182	10	12			7	3	2	15	15	1	3	3	3	3	3	65	1.1
FF-1065	5183	10	20			12	1	2	20	20	1	7	5	5	5	5	103	1.7
FF-1065	5188	10	17			10	2	2	20	20	2	7	6	6	6	10	97	1.6
		5	20			22	1	2	25	25	2	4	4	4	4	4	96	1.6
		5	18			21	1	1	27	27	2	4	4	4	4	4	96	1.6
			58			23	1	2	21	21	1	3	3	3	3	3	123	2.1
			32			23	1	2	22	22	1	6	6	6	6	111	1.9	
		20	20			16	2	2	40	40	2	8	8	8	8	142	2.4	
			18			15	1	3	18	18	1	3	3	3	3	69	1.1	
			18			15	1	3	18	18	1	3	3	3	3	69	1.1	
			12			8	2	2	15	15	1	4	3	3	3	62	1.0	
			17			12	2	2	19	19	1	8	8	8	8	93	1.6	
Average		5.9	27.8	0.0	0.0	20.0	1.5	3.8	26.1	1.2	5.3	5.4	5.5	5.3	5.6	113.3	1.9	

Chock Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP IN AST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
FFB-25	5079		10			10	2	2	4	9	1	5	2	2	2	49	0.8
FFB-25	5080		40			20	2	10	10	10	1	4	4	4	4	123	2.1
FFB-25	5080		35			20	1	10	10	10	1	4	4	4	4	117	2.0
FFB-25	5086	5	35			24	2	7	9	9	1	3	3	3	3	123	2.1
FFB-25	5086	5	30			20	2	5	5	14	1	3	3	3	3	117	2.0
			10			6	1	1	1	1	1	3	3	3	3	62	1.0
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
			10			7	1	1	1	5	1	3	3	3	3	40	0.7
Average		0.8	17.7	0.0	0.0	7.7	1.3	3.4	7.5	1.0	3.8	3.3	3.3	3.3	3.3	67.0	1.1

Fuel Oil Vent Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
	0		3			1	2	1	1	1	1	1	1	1	1	15	0.2
Average		0.0	3.0	0.0	0.0	1.0	2.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	14.5	0.2

Table A4-3-1 Process-Element Times (cont'd)

Flight Deck Edge Light Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
Average	44	2	10	0.0	0.0	10	1.0	2	6	1	1	1	1	1	1	37	0.6
		2.0	10.0	0.0	0.0	10.0	1.0	2.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	37.0	0.6
Nurse Pipe Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
FF-1050	4282		25			25	1	10	30	2	7	7	7	7	7	103	1.7
CBA-33	4290	10	60			120	1	4	15	1	9	9	9	7	7	250	4.2
CBA-33	4290	10	60			120	1	4	15	1	9	9	9	7	7	246	4.1
LST-1182	4303	33	33			20	1	5	15	1	8	9	9	7	7	115	1.9
LST-1182	4303	33	33			20	1	5	15	1	8	9	9	7	7	115	1.9
D06-13	4334	10	23			23	1	10	20	1	5	6	5	5	5	93	1.6
D06-13	4334	10	27			27	1	12	20	1	6	6	6	5	5	99	1.7
D06-13	5056	10	20			20	2	10	15	1	5	5	5	5	5	123	2.1
FFB-25			17			18	1	3	30	1	5	5	5	5	5	96	1.6
						12	1	2	26	1	5	5	5	5	5	82	1.4
Average		5.0	26.7	0.0	0.0	40.7	1.1	6.5	20.1	1.1	6.4	6.7	6.1	6.0	6.0	132.3	2.2
Junction Box Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
Average	44	2	14	0.0	0.0	7	1	3	5	1	1	1	1	1	1	38	0.6
		2.0	14.0	0.0	0.0	7.0	1.0	3.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	38.0	0.6
Scuttle Handheel Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
Average	4	0.0	6	0.0	0.0	12	1	1	6	1	1	1	1	1	1	32	0.5
		0.0	6.0	0.0	0.0	12.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	32.0	0.5
VMS 3-Dog Cover																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
Average	4	0.0	4	0.0	0.0	2	3	1	5	1	2	2	2	2	2	24	0.4
		0.0	4.0	0.0	0.0	2.0	2.5	1.0	1.0	5.0	1.0	1.5	1.5	1.5	1.5	24.0	0.4

Table A4-3-1 Process-Element Times (cont'd)

Life Raft Cradle																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
	•		16			14	2	2	15	2	5	5	5	5	5	75	1.3
Average		0.0	16.0	0.0	0.0	14.0	2.0	2.0	15.0	2.0	5.0	5.0	4.5	4.5	5.0	75.0	1.3

Portable Davit																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
FF-1050	4331	10	34		5	20	1	20	28	1	7	7	7	8	7	135	2.6
DOE-15	4332		33		4	27	1	20	25	1	4	3	3	4	5	133	2.2
DOE-15	4332		40		5	29	1	20	30	1	5	4	4	5	4	147	2.5
	•		75		2	60	3	4	30	2	10	8	8	8	8	218	3.6
	•		25		5	25	2	8	30	2	4	6	6	6	6	125	2.1
Average		2.0	41.8	0.0	4.2	32.2	1.6	14.4	28.5	1.4	6.0	5.6	6.2	6.0	5.6	155.5	2.6

Portable Davit Socket/Cap																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
FF-1065	5182	5	12		5	9	3	4	14	10	4	5	4	4	4	78	1.3
FF-1065	5183	5	15		5	15	2	2	15	10	8	16	15	8	5	121	2.0
	•	15	22		5	14	2	3	17	2	3	4	4	4	4	99	1.7
	•		12		5	9	3	3	14	2	4	8	7	8	8	83	1.4
Average		6.3	15.3	0.0	3.8	11.8	2.5	3.0	15.0	6.0	4.8	8.3	7.5	6.0	5.3	95.3	1.6

Watertight Door Dog																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
	•		1		1	1	1	1	2	1	1	1	1	1	1	9	0.1
Average		0.0	1.0	0.0	1.0	1.0	0.5	0.5	1.5	0.5	0.3	0.5	0.5	0.5	0.5	8.5	0.1

Table A4-3-1 Process-Element Times (cont'd)

SHIP	JULIAN DATE	SILVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL H-MIN	TOTAL H-HR
206-15	4344		54			20		1	12		7	7	7	7	7	177	3.0
206-15	4344		50			20		1	12		7	7	7	7	7	172	2.9
206-15	4344		50			20		1	10		7	7	7	7	7	172	2.9
206-15	4348		135		2	90		2	20		10	10	10	10	10	338	5.6
206-15	4348		100		2	45		1	20		10	10	10	10	10	287	4.5
206-15	4348		115		2	45		1	20		10	10	10	10	10	276	4.6
206-15	4348		55			40		1	20		10	10	10	10	10	205	3.4
206-15	4348		45			45		1	15		10	10	10	10	10	204	3.4
206-15	4348		37			45		1	15		10	10	10	10	10	196	3.3
206-15	4348		40			45		1	15		10	10	10	10	10	202	3.4
206-15	5009	10	60			35		1	20		7	7	7	7	7	196	3.3
206-15	5011		50			40		1	20		8	8	8	8	8	212	3.5
206-15	5011		50			40		1	20		8	8	8	8	8	206	3.4
LST-1185	5106		45			19		1	12		5	5	5	5	5	204	3.4
LST-1185	5109		45			20		1	15		5	5	5	5	5	154	2.6
LST-1185	5109		50			20		1	10		5	5	5	5	5	154	2.6
LST-1185	5112		55			17		1	10		5	5	5	5	5	188	3.2
LST-1185	5112		75			20		1	27		5	6	6	6	6	187	3.2
LST-1185	5112		55			14		1	12		5	6	6	6	6	196	3.3
LST-1185	5114		65			20		1	9		5	5	5	5	5	193	3.2
LST-1185	5114		70			15		1	9		5	5	5	5	5	198	3.3
LST-1185	5114		60			20		1	10		5	5	5	5	5	178	3.0
LST-1185	5114		67			20		1	10		5	5	5	5	5	178	3.0
LST-1185	5123		70	45		15		1	9		5	5	5	5	5	197	3.3
LST-1185	5123		49			29		1	14		6	6	6	6	6	264	4.4
LST-1185	5126		60			17		1	10		7	7	7	7	7	207	3.5
LST-1185	5126		90			33		1	12		7	7	7	7	7	231	3.9
LST-1185	5126		90			19		1	12		7	7	7	7	7	252	4.2
LST-1185	5126		42			37		1	12		5	6	6	6	6	247	4.1
LST-1185	5127		90	45		20		1	10		5	5	5	5	5	181	3.0
LST-1185	5127		75			25		1	12		5	5	5	5	5	280	4.7
LST-1185	5133		42			35		1	9		5	5	5	5	5	179	3.0
LST-1185	5133		57	90		14		1	12		6	6	6	6	6	185	3.1
LST-1185	5135		49			30		1	8		5	5	5	5	5	300	5.0
LST-1185	5135		52			14		1	10		5	5	5	5	5	177	3.0
LST-1185	5137		48			20		1	11		5	5	5	5	5	187	3.1
LST-1185	5148		35			16		1	10		5	6	6	6	6	183	3.1
FF-1045	5177		45			45		1	3		10	10	10	10	10	163	2.7
FF-1045	5183		60		25	45		3	5		10	10	10	10	10	160	2.7
FF-1045	5184		45		10	45		3	5		10	10	10	10	10	286	4.8
FF-1045	5186		45		10	40		2	4		10	10	10	10	10	233	3.9
FF-1045	5186		60		10	40		2	4		10	10	10	10	10	152	2.5
FF-1045	5186		40		10	40		2	4		10	10	10	10	10	197	3.3
FF-1045	5186		40		10	45		2	4		10	10	10	10	10	281	4.4
FF-1045	5186		20		10	45		2	4		10	10	10	10	10	184	3.1
FF-1045	5188		87		8	14		1	2		11	10	10	10	10	170	2.0
FF-1045	5188	20	30		8	35		1	10		4	4	4	4	4	217	3.6
FF-1045	5188		35			29		1	1		6	6	6	6	6	136	2.3
FF-1045	5188		35			29		1	1		6	6	6	6	6	136	2.3
Average		6.9	55.9	3.8	10.6	30.7	1.2	11.0	44.8	1.5	7.2	7.7	7.2	7.3	7.4	205.1	3.4

Table A4-3-1 Process-Element Times (cont'd)

Watertight Door (Seal)																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHTEN	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
DDE-15	4315	10	10			40	1	20	40	1	8	8	9	9	8	2.7
DDE-15	4360					25	1	10	25	1	9	10	9	10	10	1.8
Average		5.0	5.0	0.0	0.0	32.5	1.0	15.0	32.5	1.0	8.5	9.0	9.0	9.5	9.0	2.3
Watertight Door Port																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHTEN	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
"			5			5	1	1	5	1	1	1	1	1	1	0.4
Average		0.0	5.0	0.0	0.0	5.0	1.0	0.5	5.0	1.0	1.0	1.0	1.0	1.0	1.0	0.4
Ventilation Exhaust Ducting																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHTEN	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
"		10	10			17	16	1	17	2	2	2	2	2	2	1.4
Average		10.0	10.0	0.0	0.0	17.0	16.0	1.0	17.0	2.0	2.0	2.0	2.0	2.0	2.0	1.4
Boat Lifting Eye																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHTEN	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
"		4	7			6	5	1	4	1	1	1	1	1	1	0.6
Average		4.0	7.0	0.0	0.0	6.0	5.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6
FAS Bulhead Mount																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHTEN	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
"			30			2	20	2	25	1	4	5	5	5	5	1.8
Average		0.0	30.0	0.0	0.0	2.0	20.0	2.0	25.0	1.0	4.0	5.0	5.0	5.0	5.0	1.8

Table A4-3-1 Process--Element Times (cont'd)

FAB Bulkhead Swivel																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
DD-992	5078	5	10	10	10	7	1	4	4	1	1	1	1	1	1	47	0.8
DD-992	5078	5	10	10	10	7	1	4	4	1	1	1	1	1	1	47	0.8
DD-992	5078	5	10	10	10	7	1	4	4	1	1	1	1	1	1	47	0.8
FFB-25	5056	5	8		9	8	2	4	5	1	5	3	3	3	3	57	1.0
FFB-25	5056	5	10		10	8	2	4	5	1	5	3	3	3	3	60	1.0
FFB-25	5056	5	10		10	8	2	5	7	1	5	3	3	3	3	62	1.0
FFB-25	5056	5	10		10	8	2	4	5	1	5	3	3	3	3	60	1.0
FFB-9	5076	5	10		5	3	1	2	4	1	1	1	1	1	1	36	0.6
FFB-9	5076	5	10		5	3	1	2	4	1	1	1	1	1	1	36	0.6
FFB-9	5076	5	10		5	3	1	2	4	1	1	1	1	1	1	36	0.6
FFB-9	5076	2	2	1	1	5	1	1	4	1	1	1	1	1	1	19	0.3
FFB-9	5076	3	3	3	5	7	1	1	4	1	1	1	1	1	1	30	0.5
FFB-9	5076	3	2	3	5	3	1	1	4	1	1	1	1	1	1	25	0.4
FFB-9	5076	2	2	2	1	3	1	1	3	1	1	1	1	1	1	19	0.3
FFB-9	5076	2	2	2	1	3	1	1	3	1	1	1	1	1	1	19	0.3
Average		4.2	7.6	0.0	6.5	5.4	1.2	2.6	4.2	1.0	1.5	1.5	1.5	1.5	1.5	40.1	0.7

SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TIGHT	FAS Piping										TOTAL M-HR
							DA	PREHEAT	THERMAL SPRAY	DA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR	
*		10	10		15	13	1	2	19	2	2	2	2	2	80	1.3	
*		10	10		17	16	1	2	18	2	1	1	1	1	81	1.4	
*		10	10		19	16	1	2	16	2	1	1	1	1	81	1.3	
*		10	10		16	18	1	2	15	2	1	1	1	1	79	1.3	
Average		10.0	10.0	0.0	16.8	15.8	1.0	2.0	17.0	1.9	1.1	1.1	1.1	1.1	80.0	1.3	

SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAP/PLUG	ANCHOR TOOTH	FAS Survival Area								TOTAL H-HR	
							THERMAL SPRAY	DA	PREPAINT	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5		TOTAL H-MIN
*		3	5		5	12	1	1	15	1	3	3	3	3	56	0.9
*		5	5	3	4	8	1	1	13	1	3	3	3	3	49	0.8
*		5	5		5	9	1	1	8	1	3	3	3	3	48	0.8
*		5	5		4	10	1	1	14	1	3	3	3	3	54	0.9
Average		4.5	4.5	0.0	4.5	9.8	1.0	1.0	12.5	1.0	2.5	2.5	2.5	2.5	51.3	0.9

SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TUBTH	FAS Survival Area Assembly								TOTAL H-HR	
							DA	PRECAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4		PAINT #5
00-972	5078	5	50		10	22	3	8	15	3	3	3	3	3	131	2.2
00-972	5078	5	50		10	22	3	8	15	3	3	3	3	3	131	2.2
00-972	5078	5	50		10	22	3	8	15	3	3	3	3	3	131	2.2
FFB-25	5064	5	21		16	15	5	11	15	7	7	7	7	7	126	2.1
FFB-25	5068	5	23		14	14	6	12	15	7	7	7	7	7	127	2.1
FFB-9	5071	5	30		16	16	6	10	20	3	4	4	4	4	110	1.8
FFB-9	5071	5	30		6	16	6	10	20	3	4	4	4	4	110	1.8
	•		9		6	23	3	2	13	4	4	4	4	4	78	1.3
	•		9		6	20	3	2	15	4	4	4	4	4	77	1.3
Average		3.9	30.2	0.0	8.0	18.9	4.2	7.9	15.8	3.3	4.2	4.2	4.2	4.2	113.4	1.9

Table A4-3-1 Process-Element Times (cont'd)

[illegible]

Table A4-3-1 Process-Element Times (cont'd)

[illegible]

Minch Safety Guard

SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACTID/BASE GIP	TAPF/PLUG	ANCHOR TOOTH	QA	PREPARET	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL H-RIN	TOTAL H-HR
	9		10			10	1	3	30	1	8	7	7	7	7	99	1.7
	8		8			6	3	3	14	1	6	8	8	7	8	72	1.2
Average		0.0	9.0	0.0	0.0	8.0	2.0	3.0	22.0	1.0	7.0	8.5	8.5	8.0	8.5	85.5	1.4

Marine Strainer Handle

SHIP	JULIAN DATE	SOLVENT CLEAN	ST/TP BLAST	ACT/D BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	DA	PREHEAT	THERMAL SPRAY	DA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
FFB-Z5	5050		10			7	2	4	7	1	2	2	2	2	2	41	0.7
FFB-Z5	5050		10			7	2	4	7	1	2	2	2	2	2	41	0.7
FFB-Z5	5050		10			7	2	4	7	1	2	2	2	2	2	41	0.7
FFB-Z5	5050		10			7	2	4	7	1	2	2	2	2	2	41	0.7
FFB-Z5	5050		7			4	1	2	4	1	1	1	1	1	1	26	0.4
FFB-Z5	5083	2	10			4	1	2	4	1	1	1	1	1	1	26	0.4
FFB-Z5	5083	2	1			4	2	2	2	1	1	1	1	1	1	13	0.2
FFB-Z5	5083		1			6	2	1	2	1	1	1	1	1	1	18	0.3
FFB-Z5	5083		3			6	1	1	2	1	1	1	1	1	1	18	0.3
Average		0.4	7.6	0.0	0.0	3.6	1.6	2.9	5.2	0.9	1.6	1.6	1.6	1.6	1.6	32.0	0.5

Table A4-3-1 Process-Element Times (cont'd)

Dark Handrail																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
LST-1182	439		21			7	1	3	12	1	7	7	5	5	5	75	1.3
LST-1182	439		21			7	1	4	10	1	8	8	5	5	5	78	1.3
LST-1182	439		21			6	1	5	10	1	7	7	5	5	5	74	1.2
LST-1182	439		21			5	1	6	13	1	7	7	5	5	5	77	1.3
LST-1182	439		20			5	1	5	12	1	6	6	5	5	5	72	1.2
LST-1182	439		21			6	1	4	10	1	8	8	5	5	5	73	1.3
LST-1182	439		20			5	1	5	12	1	7	7	5	5	5	70	1.2
LST-1182	439		20			5	1	5	10	1	6	6	5	5	5	70	1.2
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
LST-1182	439		35			5	1	5	10	1	4	4	5	5	5	79	1.3
Average		0.0	28.2	0.0	0.0	5.4	1.0	3.7	10.6	1.0	5.4	5.4	5.4	5.4	5.4	76.6	1.3
Handrail (4" Diameter)																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
2D-992	5017		10			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
00-992	5017		2			10	1	2	6	1	1	1	1	1	1	37	0.6
Average		2.0	10.0	0.0	0.0	10.0	1.0	2.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	37.0	0.6
Handrail (18" Diameter)																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
*			3			3	1	1	10	1	1	2	2	2	2	26	0.4
*			3			3	1	1	10	1	1	2	2	2	2	26	0.4
*			3			3	1	1	10	1	1	2	2	2	2	26	0.4
*			3			3	1	1	10	1	1	2	2	2	2	26	0.4
Average		0.0	3.0	0.0	0.0	2.5	1.0	1.0	10.0	1.0	1.0	1.5	1.5	1.5	1.5	25.5	0.4
Handrail (2' Diameter)																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
FFB-25	5079	5				9	1	7	10	1	2	2	2	2	2	43	0.7
Average		5.0	0.0	0.0	0.0	9.0	1.0	7.0	10.0	1.0	2.0	2.0	2.0	2.0	2.0	43.0	0.7

Table A4-3-1

Hatch																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREFEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL H-HIN	TOTAL H-HR
006-15	5009	10	40	50	15	55	1	20	45	1	10	10	9	9	9	249	4.2
006-15	5011	10	43	50	5	35	1	20	50	1	10	8	9	9	9	210	3.5
006-15	5011				10	35	1	20	40	1	8	8	8	8	8	202	3.4
006-15	5011				10	50	1	25	50	1	0	8	8	9	9	228	4.3
00-992	5018		67	50	10	60	1	40	60	1	5	5	5	5	8	260	3.9
00-992	5018		47	50	10	59	1	20	55	1	3	3	3	4	4	211	3.5
00-992	5025	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
00-992	5025	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
00-992	5025	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
00-992	5033	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
00-992	5033	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
00-992	5031	10	40	40	10	42	1	10	50	2	3	3	3	5	5	190	3.2
FF6-9	5058	10	45	30	11	20	1	10	37	1	4	4	4	4	4	153	2.6
FF6-25	5092	10	35	30	15	15	2	3	25	1	5	5	5	5	5	101	1.7
LST-1185	5123	10	90	90	15	30	1	9	51	1	4	5	5	5	5	240	4.0
LST-1185	5123	10	85	85	15	30	1	10	47	1	5	5	6	6	6	227	3.8
LST-1185	5123	10	160	160	15	30	1	20	42	1	7	7	7	7	7	314	3.2
LST-1185	5134	10	49	49	14	30	1	14	40	1	6	6	7	6	7	192	3.2
LST-1185	5136	10	40	40	12	30	1	11	47	1	6	7	6	7	7	185	3.1
LST-1185	5151	10	30	30	10	12	1	10	40	1	5	5	7	7	7	147	2.5
LST-1185	5179		125	LST-1185	6	45	2	4	70	15	3	3	3	2	3	279	4.7
LST-1185	5179		36	LST-1185		20	1	10	30	10	1	2	2	2	3	117	2.0
Average		6.8	56.8	0.0	9.4	36.7	1.1	13.9	46.8	2.3	5.5	5.7	5.9	5.8	6.0	202.6	3.4

Hinge																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREFEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL H-HIN	TOTAL H-HR
LST-1185	5106	2	10	10		10	1	4	5	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	5	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	5	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.6
LST-1185	5106	2	10	10		10	1	4	4	1	1	1	1	1	1	38	0.

Table A4-3-1 Process-Element Times (cont'd)

[illegible]

Table A4-3-1

Hinge (Cont'd)

Vertical Ladder

AND/OR

Pyro Locker

Answer

Table A4-3-1 Process-Element Times (cont'd)

SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ FLUX	ANCHOR TOOTH	Paint										TOTAL M-HR
							DA	PRE-PAINT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	
LP2-10	4276	10	23	10	12	15	1	3	20	1	3	2	1	90	1.5		
SRU-13	4290		30		10	10	1	1	7	1	1	2	1	41	0.7		
SRU-13	4302				10	12	1	1	10	1	1	2	1	70	1.2		
SRU-13	4302				10	10	1	1	4	1	1	2	1	44	0.7		
SRU-13	4302		30		30	10	2	3	30	1	3	2	2	45	0.8		
SRU-13	4302				30	10	1	3	10	1	5	5	1	81	1.4		
SRU-13	4302				30	10	1	2	10	1	5	5	3	65	1.1		
SRU-13	4302				30	10	1	3	10	1	5	5	3	64	1.1		
SRU-13	4309		20		13	10	1	4	15	1	5	2	2	68	1.1		
SRU-13	4317		15		8	10	1	4	8	1	2	2	2	68	1.1		
SRU-13	4317		15		8	10	1	5	8	1	2	1	1	51	0.9		
SRU-13	4317		15		8	10	1	5	8	1	2	1	1	51	0.9		
SRU-13	4317		15		13	10	1	5	8	1	2	1	1	51	0.9		
SRU-13	4331		15		15	10	1	5	10	1	3	3	3	67	1.1		
SRU-13	4331		15		15	10	1	5	10	1	3	3	3	67	1.1		
SRU-12	4344		15		10	9	1	5	10	1	3	3	3	55	0.9		
SRU-40	4348		10		10	10	1	7	10	1	4	3	3	54	0.9		
SRU-12	4359		15		12	9	1	10	10	1	2	2	2	62	1.0		
SRU-12	5007				10	7	1	5	8	1	2	2	2	36	0.6		
SRU-12	5007				10	10	1	5	8	1	2	2	2	36	0.6		
SRU-12	5007				15	10	1	3	5	1	1	1	1	16	0.3		
SRU-12	5007				10	7	1	4	8	1	2	2	2	41	0.7		
SRU-12	5007				10	7	1	5	8	1	2	2	2	36	0.6		
SRU-12	5010				10	10	1	5	10	1	1	1	1	53	0.9		
SRU-12	5010				15	10	1	5	10	1	1	1	1	58	1.0		
SRU-13	5016				14	20	1	5	10	1	1	1	1	50	0.8		
SRU-13	5016				15	24	1	5	10	1	1	1	1	50	0.8		
LP4-10	5023				14	15	1	5	8	1	2	2	2	50	0.8		
LP4-10	5023				14	15	1	7	8	1	2	2	2	50	0.8		
LP4-10	5023				14	15	1	7	8	1	2	2	2	50	0.8		
FF5-23	5027				35	35	1	8	32	1	2	2	2	120	2.0		
FF6-23	5027				30	40	1	10	40	1	3	3	3	128	2.1		
FF6-23	5037				30	30	1	9	35	1	3	3	3	115	1.9		
FF5-23	5037				25	25	1	5	25	1	2	2	2	84	1.4		
SRU-12	5056				20	10	1	5	8	1	2	1	1	49	0.8		
SRU-12	5056				25	20	1	7	8	1	2	1	1	65	1.1		
SRU-12	5056				20	10	1	6	8	1	2	1	1	65	1.1		
SRU-12	5056	10			20	10	1	5	5	1	2	2	2	56	0.9		
SRU-12	5070				10	10	1	4	5	1	1	1	1	34	0.6		
SRU-12	5070				10	10	1	4	5	1	1	1	1	34	0.6		
SRU-12	5070				10	10	1	4	5	1	1	1	1	34	0.6		
SRU-12	5070				10	10	1	5	8	1	2	1	1	54	0.9		
SRU-12	5070	10			15	10	1	4	5	1	2	2	2	74	0.6		
SRU-12	5070				20	10	1	5	5	1	2	2	2	57	1.0		
SRU-12	5070				20	10	1	4	7	1	2	2	2	57	1.0		
SRU-12	5070				20	10	1	4	7	1	2	2	2	57	1.0		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087				10	5	2	2	10	1	1	1	1	42	0.7		
SRU-12	5087																

Table A4-3-1 Process-Element Times (cont'd)

Manifold (Cont'd)																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HIN	TOTAL M-HR
SBU-12	5142	10				26	17	1	6	10	2	4	3			79	1.3
SBU-12	5142	10				26	17	1	6	10	2	4	3			79	1.3
SBU-12	5142	10				26	17	1	6	10	2	4	3			79	1.3
SBU-13	5142	10				22	20	1	9	10	1	3	2			78	1.3
SBU-13	5142	10				22	20	1	9	10	1	3	2			78	1.3
SBU-12	5142	10				26	17	1	6	10	2	4	3			79	1.3
SBU-12	5151	10				13	9	1	5	9	1	3	2			53	0.9
SBU-12	5151	10				13	9	1	5	9	1	3	2			53	0.9
PH18 CB1	5184	10				15	5	2	3	15	2	3	3			58	1.0
PH18 CB1	5184	10				15	5	2	3	15	2	3	3			58	1.0
CNP	5191	10				13	10	2	2	13	2	1	1			57	1.0
CNP	5191	10				13	5	2	2	10	2	1	1			46	0.8
Average		4.2	3.6	0.1	15.7	12.7	1.2	5.1	11.0	1.1	2.4	2.0	0.0	0.0	0.0	59.2	1.0

Manifold Elbow																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HIN	TOTAL M-HR
SBU-13	4302					8	9	1	4	10	1	5	2			43	0.7
SBU-13	4302					8	12	1	4	12	1	5	2			42	0.7
PH17 CB1	4309		10			13	10	1	2	15	1	2	2			36	0.9
PH17 CB1	4309		10			13	10	1	2	15	1	2	2			36	0.9
SBU-13	4331		10			10	10	1	3	10	1	3	2			52	0.9
SBU-13	4331		15			15	10	1	5	10	1	3	2			67	1.1
LSD-40	4348		10			12	8	1	7	9	1	5	2			52	0.9
SBU-12	4365					10	7	1	4	5	1	2	1			20	0.3
SBU-12	5007					10	7	1	3	8	1	2	2			36	0.6
SBU-12	5007					10	7	1	3	8	1	2	2			36	0.6
SBU-12	5007					10	7	1	3	8	1	2	2			36	0.6
SBU-13	5038					10	10	1	4	7	1	1	1			46	0.8
LST-1182	5070		20			10	10	1	4	5	1	1	1			34	0.6
FF-1068	5080	10				20	10	1	4	7	1	2	2			57	1.0
FF-1068	5080	10				20	10	1	4	7	1	2	2			57	1.0
SBU-12	5087	10				5	3	2	2	5	1	1	1			31	0.5
SBU-12	5087	10				5	3	2	2	5	1	1	1			31	0.5
LPH-11	5087	10				5	3	2	2	5	1	1	1			31	0.5
FF-1025	5101					10	10	1	4	5	1	1	1			34	0.6
SBU-13	5142	10				22	20	1	9	10	1	2	2			78	1.3
SBU-13	5142	10				22	20	1	9	10	1	2	2			78	1.3
SBU-13	5142	10				22	20	1	9	10	1	2	2			78	1.3
PH18 CB1	5164	10				15	5	2	3	13	2	3	3			51	0.9
PH18 CB1	5164	10				15	5	2	3	13	2	3	3			51	0.9
CNP	5191	10				13	10	2	2	10	2	1	1			53	0.9
Average		4.4	3.0	0.0	11.7	9.4	1.2	4.4	8.5	1.3	2.3	2.0	0.0	0.0	0.0	48.2	0.8

Big Eyes Mount																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HIN	TOTAL M-HR
FF-25	5056	10	15		20	15	2	5	5	5	1	3	3	3	3	88	1.5
FF-25	5056	10	40		20	15	2	4	7	7	1	4	4	4	4	119	2.0
Average		10.0	27.5	0.0	20.0	15.0	2.0	4.5	6.0	1.0	3.5	3.5	3.5	3.5	3.5	103.5	1.7

Table A4-3-1 Process-Element Times (cont'd)

Saluting Gun Mount																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
	0	16	60		15	40	1	4	42	2	9	12	12	12	12	237 4.0
Average		16.0	60.0	0.0	15.0	40.0	1.0	4.0	42.0	2.0	9.0	12.0	12.0	12.0	12.0	237.0 4.0
Saluting Gun Mount Swivel																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
	0	15	15		20	14	1	2	16	1	2	3	3	3	3	97 1.6
Average		15.0	15.0	0.0	20.0	14.0	1.0	2.0	16.0	1.0	2.0	3.0	2.5	2.5	2.5	96.5 1.6
M10 Fitting																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	15		10	10	1	5	10	1	2	2	2	2	2	72 1.2
DD-992	5036	10	28		9	10	1	10	10	1	3	3	3	2	2	95 1.6
Average		10.0	16.6	0.0	9.9	10.0	1.0	5.6	10.0	1.0	3.1	3.1	2.0	2.0	2.0	76.4 1.3

Table A4-3-1 Process-Element Times (cont'd)

P-250 Box																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
CBH-35	4332	60	60	60	1	10	15	1	10	10	10	10	10	10	10	197
CBH-35	4332	60	60	60	1	10	15	1	10	10	10	10	10	10	10	197
Average		0.0	60.0	0.0	0.0	60.0	1.0	10.0	15.0	1.0	10.0	10.0	10.0	10.0	10.0	197.0
P-250 Box Base																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
DO-972	5039	50	55	50	1	18	60	2	5	3	5	5	5	5	5	159
DO-972	5039	50	55	50	1	20	64	2	5	5	5	5	5	5	5	207
Average		0.0	52.5	0.0	0.0	15.0	1.0	19.0	72.0	2.0	5.0	4.0	4.0	4.0	4.0	182.5
Fuel Gauge Plate																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
•	•	2	2	2	1	3	4	1	1	1	1	1	1	1	1	17
•	•	2	2	2	1	3	4	1	1	1	1	1	1	1	1	17
•	•	2	2	2	1	3	4	1	1	1	1	1	1	1	1	17
•	•	2	2	2	1	3	4	1	1	1	1	1	1	1	1	17
•	•	2	2	2	1	3	4	1	1	1	1	1	1	1	1	17
Average		0.0	2.0	0.0	0.0	3.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	17.0
Compressed Gas Bottle Storage Rack																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
CBH-35	5127	10	40	40	1	12	37	1	6	6	6	6	6	6	6	178
Average		10.0	40.0	0.0	0.0	47.0	1.0	12.0	37.0	1.0	6.0	6.0	6.0	6.0	6.0	178.0
Reach Rod																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
FFB-9	5057	5	10	10	0.0	5	1	3	5	1	2	2	2	2	2	40
Average		5.0	10.0	0.0	0.0	5.0	1.0	3.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	40.0

Table A4-3-1 Process-Element Times (cont'd)

Ramp Roller																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
	00	5	20	0.0	4.0	10.0	1.0	2.0	10.0	1.0	4.0	4.0	4.0	4.0	4.0	1.2
Average		5.0	20.0	0.0	4.0	10.0	1.0	2.0	10.0	1.0	4.0	4.0	4.0	4.0	4.0	1.2
Line Reel																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
D06-15	5014		50			45	1	25	45	1	10	10	10	10	10	217
D06-15	5014		15			20	1	15	35	1	8	8	8	8	8	178
D06-15	5014		70			45	1	25	35	1	10	10	10	10	9	246
D06-15	5016		37			45	1	9	40	1	3	3	3	3	3	148
Average		0.0	43.0	0.0	0.0	38.8	1.0	18.5	43.8	1.0	7.8	7.8	7.8	8.0	7.5	184.8
																3.1
Line Reel Mount																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
D06-15	5014		10			15	1	10	15	1	8	8	8	8	8	93
LST-1185	5148		15			10	1	7	10	1	5	5	5	5	5	78
LST-1185	5148		10			10	1	7	10	1	5	5	5	5	5	78
LST-1185	5148		10			10	1	7	10	1	5	5	5	5	5	78
LST-1185	5148		10			10	1	7	10	1	5	5	5	5	5	78
LST-1185	5148		10			10	1	7	10	1	5	5	5	5	5	78
			8			5	1	1	8	1	3	3	3	3	3	35
			7			5	1	1	9	1	3	3	3	3	3	35
			10			12	1	1	6	1	3	3	3	3	3	46
			15			13	1	1	7	1	3	3	3	3	3	53
Average		5.0	12.5	0.0	0.0	10.0	1.0	4.9	9.5	1.0	4.4	4.4	4.4	4.4	4.3	65.2
																1.1
Line Reel Shaft Housing																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
		4	3		4	3	1	1	3	1	1	1	1	1	1	22
		4	3		4	3	1	1	3	1	1	1	1	1	1	22
Average		4.0	3.0	0.0	4.0	3.0	1.0	0.5	3.0	1.0	0.5	0.5	0.5	0.5	0.5	22.0
																0.4
Bullnose Screen																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR
FFB-75	5057	10	25			15	2	4	15	1	4	4	4	4	4	92
Average		10.0	25.0			15.0	2.0	4.0	15.0	1.0	4.0	4.0	4.0	4.0	4.0	92.0
																1.5

Table A4-3-1 Process-Element Times (cont'd)

Scuttle																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
D06-15	5011	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
D06-92	5023	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
D06-92	5023	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
FFB-9	5027	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5193	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5193	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5193	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5193	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5193	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
Average		4.5	30.5	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
Unrep Shackle																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
FFE-9	5028	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
FFE-9	5028	30	30	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
Average		5.0	45.0	0.0	0.0	30.0	2.0	5.0	25.0	1.0	5.0	5.0	5.0	5.0	5.0	138.0	2.3
Reserved Parking Sign																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
SIMASDI	5084	10	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
SIMASDI	5084	10	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
SIMASDI	5084	10	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
SIMASDI	5084	10	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
SIMASDI	5084	10	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
Average		0.0	1.7	0.0	0.0	9.2	1.2	6.3	15.8	1.2	2.3	2.3	2.3	2.3	2.3	47.0	0.8
Soot Blower																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
LPH-10	4276	10	35	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LPH-10	4276	10	35	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1125	5029	6.7	23.3	0.0	10.0	10.7	1.3	4.3	18.3	1.3	2.3	1.7	0.0	0.0	0.0	80.0	1.3
Average		6.7	23.3	0.0	10.0	10.7	1.3	4.3	18.3	1.3	2.3	1.7	0.0	0.0	0.0	80.0	1.3
Fairlead Sheave																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
LST-1185	5151	5	47	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5151	5	47	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5151	5	47	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5158	5	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5158	5	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5158	5	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5158	5	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
LST-1185	5158	5	10	0.0	1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.2
Average		4.4	23.6	0.0	16.3	17.8	1.8	6.0	12.6	1.0	3.5	4.4	4.3	4.4	4.4	104.3	1.7

Table A4-3-1

Stanchion

Table A4-3-1

Stanchion (Cont'd)

Table A4-3-1

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Table A4-3-1 Process-Element Times (cont'd)

Stanchion Support																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
D06-15	4342		10			10		4	5	1	1	1	1	1	35	0.4
D06-15	4342		10			9		3	5	1	1	1	1	1	35	0.4
D06-15	4343		15			10		4	5	1	1	1	1	1	41	0.7
D06-15	4343		10			10		3	5	1	1	1	1	1	37	0.6
D06-15	4345		15			11		3	5	1	1	1	1	1	41	0.7
LST-1185	5134	2	20	45		7		5	8	1	2	2	2	2	99	1.7
LST-1185	5134	2	20	45		7		5	8	1	2	2	2	2	99	1.7
LST-1185	5134	2	20	45		7		5	8	1	2	2	2	2	99	1.7
LST-1185	5134	2	20	45		7		5	8	1	2	2	2	2	99	1.7
LST-1185	5134	2	20	45		7		5	8	1	2	2	2	2	99	1.7
Average		1.1	16.4	24.5	0.0	8.4	1.0	4.3	6.6	1.0	1.5	1.7	1.5	1.6	71.3	1.2

Big Eyes Stand																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
8			7			12	1	1	10	1	2	2	2	2	2	40	0.7
8			7			12	1	1	10	1	2	2	2	2	2	40	0.7
Average		0.0	7.0	0.0	0.0	12.0	1.0	0.5	10.0	1.0	2.0	1.5	1.5	1.5	1.5	39.5	0.7

Stopper																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1	2	2	2	2	47	0.8
LST-1182	4274	2	10		6	5	5	1	7	5	1						

Table A4-3-1 Process-Element Times (cont'd)

50 Cal Tripod																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHTEN	OA	PREHEAT	THERMAL SPRAY	OA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR	TOTAL M-MIN
DD-972	5008		45			30	1	10	12	1	1	5	4	4	4	120	2.0
DD-972	5008		45			30	1	10	12	1	1	5	4	4	4	120	2.0
DD-972	5014		15			15	1	5	10	1	1	4	4	4	4	67	1.1
DD-972	5014		15			15	1	5	10	1	1	4	4	4	4	67	1.1
DD-972	5014		15			15	1	5	10	1	1	4	4	4	4	67	1.1
DD-972	5014		15			15	1	5	10	1	1	4	4	4	4	67	1.1
FFB-25	5056		40			30	2	10	14	1	1	5	5	5	5	122	2.0
FFB-25	5056		44			30	2	10	10	1	1	5	5	5	5	74	1.2
FFB-25	5057		24			15	2	5	7	1	1	4	4	4	4	65	1.4
FFB-25	5057		20			20	2	10	12	1	1	4	4	4	4	94	1.4
FFB-25	5057		20			24	1	4	17	1	1	6	6	6	6	79	1.3
FFB-25	5057		20			9	1	2	20	1	1	5	5	5	5	79	1.3
FFB-25	5057		20			9	1	2	20	1	1	5	5	5	5	79	1.3
FFB-25	5057		20			9	1	2	20	1	1	5	5	5	5	79	1.3
Average		0.0	25.6	0.0	0.0	19.0	1.3	6.1	13.1	1.0	4.5	4.7	4.5	4.5	4.5	88.6	1.5

50 Cal Tripod Shield																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TIGHT	OA	PREHEAT	THERMAL SPRAY	OA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR	TOTAL M-MIN
DDG-15	5011		40			55	1	30	40	1	8	8	8	8	8	207	3.5
DDG-15	5014		20			40	1	10	20	1	4	4	4	5	4	113	1.9
DD-972	5028		50			45	1	10	35	1	2	2	2	2	2	152	2.5
DD-972	5028		20			45	1	10	35	1	2	2	2	2	2	152	2.5
•	•		20			12	1	2	16	1	2	2	2	2	2	62	1.0
•	•		20			13	1	1	18	1	2	1	1	2	2	64	1.1
•	•		20			14	1	3	20	1	2	2	2	2	2	69	1.2
Average		0.0	31.4	0.0	0.0	32.0	1.0	9.4	26.3	1.0	3.1	3.3	3.0	3.3	3.1	117.0	2.0

50 Cal Tripod Carriage																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUS	ANCHOR TIGHTEN	OA	PREHEAT	THERMAL SPRAY	OA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-HR	TOTAL M-MIN
DD-972	5008		10			10	1	1	9	1	2	3	3	3	3	50	0.8
DD-972	5008		10			10	1	1	7	1	2	3	3	3	3	52	0.9
DD-972	5008		10			10	1	1	8	1	2	3	3	3	3	52	0.9
DD-972	5008		10			10	1	1	9	1	2	3	3	3	3	53	0.9
DD-972	5008		10			10	1	1	10	1	2	3	3	3	3	54	0.9
DD-972	5008		10			10	1	1	9	1	2	3	3	3	3	54	0.9
DD-972	5008		10			10	1	1	8	1	2	3	3	3	3	55	0.9
DD-972	5008		10			10	1	1	7	1	2	3	3	3	3	55	0.9
DD-972	5008		10			10	1	1	10	1	2	3	3	3	3	59	1.0
DD-972	5008		10			10	1	1	7	1	2	3	3	3	3	63	1.1
DD-972	5008		10			10	1	1	10	1	2	3	3	3	3	63	0.9
DD-972	5008		10			10	1	1	8	1	2	3	3	3	3	58	1.0
Average		3.4	9.7	.0	7.6	7.9	1.1	0.5	9.3	1.1	3.0	2.9	3.2	3.0	3.1	56.0	0.9

Table A4-3-1 Process-Element Times (cont'd)

50 Cal Tripod Voke

SHIP	ALLIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TIGHTEN	QA	PREHEAT	TEMPERATURE SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL P-HR
	0	10	10	0.0	5.0	8.0	1.0	2.0	16.0	1.0	3.0	2.0	2.0	2.0	2.0	1.1
Average		10.0	10.0	0.0	5.0	8.0	1.0	2.0	16.0	1.0	3.0	2.0	2.0	2.0	2.0	1.1

50 Cal Tripod Voke Mount

SHIP	ALLIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TIGHTEN	QA	PREHEAT	TEMPERATURE SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL P-HR
	0	10	5	0.0	5.0	4.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6
Average		10.0	5.0	0.0	5.0	4.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6

1/4" Globe Valve

SHIP	ALLIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TIGHTEN	QA	PREHEAT	TEMPERATURE SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL P-HR
LSP-11	5092					30	10	2	10	2	2	2	2			1.0
LSP-11	5092					30	10	2	10	2	2	2	2			1.0
LSP-11	5092					30	10	2	10	2	2	2	2			1.0
CS-11	5094					20	10	2	10	2	2	2	2			0.9
CS-11	5094					20	10	2	10	2	2	2	2			0.9
Average		0.0	0.0	0.0	26.7	10.0	2.0	4.0	10.0	2.0	2.0	2.0	0.0	0.0	0.0	58.7

3/8" Globe Valve

SHIP	ALLIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TIGHTEN	QA	PREHEAT	TEMPERATURE SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL P-HR
FF-1065	5094					20	10	2	10	2	2	2				0.9
Average		0.0	0.0	0.0	20.0	10.0	2.0	8.0	10.0	2.0	2.0	2.0	0.0	0.0	0.0	54.0

Table A4-3-1 Process-Element Times (cont'd)

1/2" Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
CE-23	5070					30	21	3	9	12	3	5	4			87	1.5
CE-32	5088					30	20	2	2	10	2	2	2			70	1.2
CE-32	5088					30	20	2	2	10	2	2	2			70	1.2
CE-32	5088					30	20	2	2	10	2	2	2			70	1.2
CE-32	5088					64	21	7	9	23	4	4	4			136	2.3
Average		0.0	0.0	0.0	0.0	36.8	20.4	3.2	4.8	13.0	2.6	3.0	2.8	0.0	0.0	86.6	1.4
3/4" Governor Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
LPD-9	5200	5				76	56	4	16	40	4	10	10			221	3.7
Average		5.0	0.0	0.0	0.0	76.0	56.0	4.0	16.0	40.0	4.0	10.0	10.0	0.0	0.0	221.0	3.7
3/4" Globe Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
CE-27	5088					15	10	1	1	5	1	1	1			35	0.6
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
LSO-33	5093					22	14	2	4	10	2	2	2			58	1.0
Average		0.0	0.0	0.0	0.0	21.3	13.6	1.9	3.7	9.5	1.9	1.9	1.9	0.0	0.0	35.7	0.9
1" Governor Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
CE-32	5150	5				33	36	3	21	30	3	8	7			146	2.4
Average		5.0	0.0	0.0	0.0	33.0	36.0	3.0	21.0	30.0	3.0	8.0	7.0	0.0	0.0	146.0	2.4
1" Reducer Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	TOTAL M-HR
CE-32	5010					56	20	4	10	19	3	4	3			63	1.1
DS-15	5100						14	8	10	20	4	4	4			120	2.0
Average		0.0	0.0	0.0	0.0	28.0	17.0	6.0	10.0	19.5	3.5	4.0	3.5	0.0	0.0	91.5	1.5

Table A4-3-1 Process-Element Times (cont'd)

1" Constant Pressure Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
CE-32	4300				9	13	4	11	22	4	9	8				77	1.3
CE-32	5010							2	16	2	2	2				56	0.9
Average		0.0	0.0	0.0	4.5	16.0	3.0	10.5	19.0	3.0	5.5	5.0	0.0	0.0	0.0	66.5	1.1
1" Globe Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
FF-1065	5088				40	10	4	2	10	2	2	2				72	1.2
Average		0.0	0.0	0.0	40.0	10.0	4.0	2.0	10.0	2.0	2.0	2.0	0.0	0.0	0.0	72.0	1.2
1-1/2" Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
LPH-3	4302				18	15	1	10	15	1	5	5				70	1.2
LPH-3	4302				14	14	1	4	13	1	4	4				55	0.9
FF-1068	4302				24	30	2	9	28	1	4	4				102	1.7
CE-29	5070				30	21	3	9	12	3	5	4				87	1.5
CE-72	5094				20	10	2	8	10	2	2	2				58	0.9
CE-32	5134	5			19	14	1	4	12	1	3	2				61	1.0
Average		0.8	0.0	0.0	20.8	17.3	1.7	7.3	15.0	1.5	3.8	3.5	0.0	0.0	0.0	71.8	1.2
2" Globe Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
FF-1063	5004				10	15	2	14	19	2	4	4				70	1.2
FF-1063	5007				14	15	2	14	14	2	3	3				67	1.1
Average		0.0	0.0	0.0	12.0	15.0	2.0	14.0	16.5	2.0	3.5	3.5	0.0	0.0	0.0	68.5	1.1
2" Reducing Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
CE-32	5102	5			73	44	3	14	30	6	11	10				196	3.3
Average		5.0	0.0	0.0	73.0	44.0	3.0	14.0	30.0	6.0	11.0	10.0	0.0	0.0	0.0	196.0	3.3
3" Reducing Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
LPH-9	5200	6	10		50	35	3	10	50	32	3	3				202	3.4
Average		6.0	10.0	0.0	50.0	35.0	3.0	10.0	50.0	32.0	3.0	3.0	0.0	0.0	0.0	202.0	3.4

Table A4-3-1 Process-Element Times (cont'd)

3" Feed Check Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
006-7	5073				45	69	3	13	25	3	4	4				166	2.8
Average		0.0	0.0	0.0	45.0	69.0	3.0	13.0	25.0	3.0	4.0	4.0	0.0	0.0	0.0	166.0	2.8

3" Gate Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
LPA-10	4278	5	15		18	5	1	2	7	1	2	2				58	1.0
LPA-1	4278	5	30		40	10	2	4	17	1	5	4				118	2.0
FF-10A3	4302				25	20	2	8	20	2	6	5				88	1.5
CE-32	5087				17	5	2	4	10	1	1	1				41	0.7
CE-32	5087				17	5	2	4	10	1	1	1				41	0.7
CE-32	5087				17	5	2	4	10	1	1	1				41	0.7
Average		1.7	7.5	0.0	22.3	8.3	1.8	4.3	12.3	1.2	2.7	2.3	0.0	0.0	0.0	64.5	1.1

3" Regulating Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
006-13	4344					25	2	12	14	2	3	3				61	1.0
Average		0.0	0.0	0.0	0.0	25.0	2.0	12.0	14.0	2.0	3.0	3.0	0.0	0.0	0.0	61.0	1.0

3" Exhaust Relief Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
006-13	4348		34		28	28	3	24	26	3	9	8				163	2.7
006-13	4348		23		19	20	3	16	21	3	6	5				116	1.9
CE-32	5144	5			45	57	3	18	21	3	8	7				167	2.8
Average		1.7	19.0	0.0	30.7	35.0	3.0	19.3	22.7	3.0	7.7	6.7	0.0	0.0	0.0	148.7	2.5

3"x1-1/2" Throttle Trip Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUS	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-MIN	TOTAL M-HR
LPA-114	5078				27	20	3	9	17	3	2	2				83	1.4
Average		0.0	0.0	0.0	27.0	20.0	3.0	9.0	17.0	3.0	2.0	2.0	0.0	0.0	0.0	83.0	1.4

Table A4-3-1 Process-Element Times (cont'd)

4" Diaphragm Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
20-943	5079				10	9	1	4	7	1	2	1				35
Average		0.0	0.0	0.0	10.0	9.0	1.0	4.0	7.0	1.0	2.0	1.0	0.0	0.0	0.0	35.0
5" Gate Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
CV-63	4309		30		24	15	1	5	10	1	3	2				91
Average		0.0	30.0	0.0	24.0	15.0	1.0	5.0	10.0	1.0	3.0	2.0	0.0	0.0	0.0	91.0
5" Main Feed Stop Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
FF-1045	5162	5			35	30	2	18	23	2	5	5				125
FF-1045	5162	5			35	30	2	18	23	2	5	5				125
Average		5.0	0.0	0.0	35.0	30.0	2.0	18.0	23.0	2.0	5.0	5.0	0.0	0.0	0.0	125.0
5" Exhaust Relief Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
LPD-9	5056				75	62	8	30	33	4	8	8				228
LPD-9	5056				75	62	8	30	33	4	8	8				228
LPD-9	5056				90	75	8	27	34	4	9	9				233
LPD-9	5144	5			39	45	3	15	21	3	8	7				146
Average		1.3	0.0	0.0	69.8	61.0	6.8	25.5	30.3	3.8	8.3	7.8	0.0	0.0	0.0	214.3
6" Diaphragm Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
CS-32	5142	10			76	64	3	16	30	6	11	10				226
CS-32	5142	10			78	51	3	18	30	6	11	10				217
Average		10.0	0.0	0.0	77.0	57.5	3.0	17.0	30.0	6.0	11.0	10.0	0.0	0.0	0.0	221.5
6" Gate Valve																
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 81	PAINT 82	PAINT 83	PAINT 84	PAINT 85	TOTAL M-HR
LPD-10	5100	10			42	20	2	10	10	2	5	5				106
Average		10.0	0.0	0.0	42.0	20.0	2.0	10.0	10.0	2.0	5.0	5.0	0.0	0.0	0.0	106.0

Table A4-3-1 Process-Element Times (cont'd)

6" Exhaust Relief Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
D06-15	4331				33	45		3	24	34	3	6	5			153	2.6
D06-21	5039	10			50	45		3	20	25	7	7	6			169	2.8
D06-21	5040	10			50	45		3	20	25	7	6	6			169	2.8
FF-1063	5134	10			51	60		2	17	34	3	8	7			192	3.2
Average		7.5	0.0	0.0	44.0	48.8	2.8	20.3	29.5	3.0	7.0	6.0	0.0	0.0	0.0	170.8	2.8

6"x4" Combined Exhaust Relief Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
D06-29	5016		20		30	50	2	13	24	2	2	3	1			124	2.1
FF-1063	5037				20	10	1	5	10	1	1	2	2			72	1.2
Average		0.0	10.0	0.0	25.0	30.0	1.5	9.0	17.0	1.5	2.5	1.5	0.0	0.0	0.0	98.0	1.6

8" Relief Valve																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
D06-15	4341	10	55		85	22	2	24	30	2	4	4				238	4.0
D06-15	4351	10	14		85	98	3	28	56	3	9	8				334	5.6
D06-15	4351	10	60		55	80	3	27	43	3	6	6				293	4.9
Average		10.0	49.7	0.0	75.0	64.7	2.7	26.3	43.0	2.7	6.3	6.0	0.0	0.0	0.0	288.3	4.8

Fuel Oil Vent																	
SHIP	JULIAN DATE	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL M-MIN	TOTAL M-HR
					5	9		1	1	6	1	3	3	3	3	36	0.6
Average		0.0	0.0	0.0	5.0	9.0	1.0	1.0	6.0	1.0	3.0	2.5	2.5	2.5	2.5	36.0	0.6

Table A4-3-1

[illegible]

Table A4-3-1 Process-Element Times (cont'd)

SHIP	JULIAN DATE	Floodlight Yoke (Cont'd)															TOTAL M-HR
		SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR	
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5079		7			5	1	2	5	1	1	1	1	1	1	26	0.4
FFB-23	5086		3			2	2	2	3	2	1	1	1	1	1	21	0.4
FFB-23	5086		3			2	2	2	3	2	1	1	1	1	1	21	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
FFB-23	5088		5			2	2	2	3	1	1	1	1	1	1	23	0.4
Average		1.1	8.1	0.0	0.0	3.7	1.2	2.4	4.3	1.1	1.0	1.0	1.0	1.0	1.0	26.7	0.4

SHIP	JULIAN DATE	Signal Searchlight Yoke										TOTAL M-HR					
		SOLVENT CLEAN	STRIP BLAST	ACID/BASE DIP	TAPE/PLUG	ANCHOR TIGHT	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1		PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-HR
DDB-7	5023	5	20		10	14	1	5	7	1	2	2	2	2	2	73	1.2
DDB-7	5023	5	20		10	14	1	5	7	1	2	2	2	2	2	73	1.2
FFB-9	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-9	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-9	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-9	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-23	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-23	5067	5	15		10	10	1	2	5	1	2	2	2	2	2	49	0.8
FFB-23	5067	5	10		2	3	1	1	7	1	2	2	2	2	2	33	0.6
FFB-23	5067	5	9		2	3	1	1	7	1	2	2	2	2	2	34	0.6
Average		4.1	15.4	0.0	3.1	9.8	1.0	2.6	5.9	1.0	2.0	2.0	2.0	2.0	2.0	52.9	0.9

Table A4-3-2 Operation Process-Element Time Summary

COMPONENT	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TIDOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT #1	PAINT #2	PAINT #3	PAINT #4	PAINT #5	TOTAL M-MIN	TOTAL M-HR
Chain Bar		25.0			32.5	1.0	6.5	12.5	1.0	1.5	1.5	1.5	1.5	1.5	86.0	1.43
Barter Bolt		5.0		5.0	5.0	1.0	4.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	30.0	0.50
J-Bolt	2.0	10.0		10.0	5.0	1.0	2.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	40.0	0.67
Accom Ladder Brace		21.7		1.4	13.1	2.0	3.9	13.6	1.0	3.8	3.7	3.6	3.6	3.6	74.9	1.25
Big Eyes Bracket		7.0			6.0	2.0	4.0	14.0	2.0	3.0	4.0	4.0	4.0	4.0	54.0	0.90
Bottle Rack Bracket	1.6	10.4			6.0	1.0	2.5	3.8	1.0	1.8	1.8	1.8	1.8	1.8	35.3	0.59
CO2 Bottle Bracket		18.0		2.0	18.0	2.0	2.0	13.0	2.0	2.5	2.5	2.5	2.0	2.0	68.5	1.14
Light Bracket/Plate	2.0	13.7			7.4	1.0	3.4	4.8	1.0	1.4	1.4	1.4	1.4	1.4	40.2	0.67
Light Bracket/Pipe	1.9	14.7			9.4	1.0	5.0	6.3	1.3	1.6	1.6	1.6	1.6	1.6	47.7	0.79
Helo Net Securing Bracket		3.0			2.5	1.0	0.5	2.0	1.0	1.5	1.0	1.0	1.0	1.0	15.5	0.26
Scupper Bracket	0.2	14.1			6.8	1.9	3.6	6.4	1.0	1.6	1.6	1.6	1.6	1.6	42.0	0.70
Sliding Padeye Bracket	3.7	5.3			7.7	1.0	1.0	9.7	1.0	3.0	2.5	2.5	2.5	2.5	42.3	0.71
Capstan Controller	4.0	28.0			15.0	2.0	3.5	10.0	1.0	3.0	2.5	3.0	3.0	3.0	78.0	1.30
Portable Cleat	5.0	4.3		2.0	16.6	0.9	3.8	7.3	1.0	3.8	3.9	3.8	3.8	3.8	60.0	1.00
Director Counterweight		6.2			5.0	1.0	4.0	5.8	1.0	1.6	1.6	2.3	2.4	2.2	33.1	0.55
Dir. Entral. (Cylindrical)		29.5			26.0	2.0	16.0	46.0	1.0	7.5	7.0	8.0	8.0	8.0	159.0	2.65
Pipe Coupling	5.0	10.0		8.0	6.0	1.0	3.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	49.0	0.82
IMC Speaker Cover		20.0		5.0	12.0	1.0	2.0	20.0	1.0	8.0	4.0	4.0	4.0	5.0	86.0	1.43
BDMS Cable Cover	3.2	8.4			10.8	2.4	2.2	17.6	1.6	5.4	6.5	6.6	5.9	6.3	77.0	1.28
Chain Locker Cover	5.9	27.8			20.0	1.5	3.8	26.1	1.2	5.3	5.4	5.5	5.3	5.6	113.3	1.89
Chock Cover	0.8	17.7		7.7	10.8	1.3	3.4	7.5	1.0	3.8	3.3	3.3	3.3	3.3	67.0	1.12
Fuel Oil Vent Cover		3.0		1.0	2.0	1.0	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	14.5	0.24
Edge Light Cover	2.0	10.0			10.0	1.0	2.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	37.0	0.62
Hawse Pipe Cover	5.0	26.7			40.7	1.1	6.5	20.1	1.1	6.4	6.7	6.1	6.0	6.0	132.3	2.21
Junction Box Cover	2.0	14.0			7.0	1.0	3.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	38.0	0.63
Handwheel Cover		6.0			12.0	1.0	1.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	32.0	0.53
VDS J-Dog Cover		4.0		2.0	2.5	1.0	1.0	3.0	1.0	1.5	1.5	1.5	1.5	1.5	24.0	0.40
Life Raft Cradle		16.0			14.0	2.0	2.0	15.0	2.0	5.0	5.0	4.5	4.5	5.0	75.0	1.25
Portable Davit	2.0	41.8		4.2	32.2	1.6	14.4	28.5	1.4	6.0	5.6	6.2	6.0	5.6	133.5	2.39
Port. Davit Socket	6.3	15.3		3.8	11.8	2.5	3.0	15.0	6.0	4.8	8.3	7.5	6.0	5.3	95.3	1.59

Table A4-3-2 Operation Process-Element Time
Summary (Cont'd)

COMPONENT	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT E1	PAINT E2	PAINT E3	PAINT E4	PAINT E5	TOTAL M-MIN	TOTAL M-HR
MT Door Dog		1.0		1.0	1.0	0.5	0.5	1.5	0.5	0.5	0.5	0.5	0.5	0.5	8.5	0.14
Watertight Door	6.9	55.9	3.8	10.6	30.7	1.2	11.0	46.8	1.5	7.2	7.7	7.2	7.3	7.4	205.2	3.42
MT Door (Small)	5.0	5.0			32.5	1.0	15.0	32.5	1.0	8.5	9.0	9.0	9.5	9.0	137.0	2.28
MT Door Port		5.0			5.0	1.0	0.5	5.0	1.0	1.0	1.0	1.0	1.0	1.0	22.5	0.38
Ducting	10.0	10.0		17.0	16.0	1.0	2.0	17.0	2.0	2.0	2.0	2.0	2.0	2.0	85.0	1.42
Boat Lifting Eye	4.0	7.0		6.0	5.0	1.0	3.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	36.0	0.60
FAS Bulkhead Mount		30.0		2.0	20.0	2.0	3.0	25.0	1.0	4.0	5.0	5.0	5.0	5.0	107.0	1.78
FAS Swivel	4.2	7.6		6.5	5.4	1.2	2.6	4.2	1.0	1.5	1.5	1.5	1.5	1.5	40.1	0.67
FAS Piping	10.0	10.0		16.8	15.8	1.0	2.0	17.0	1.9	1.1	1.1	1.1	1.1	1.1	80.0	1.33
FAS Swivel Arm	4.5	4.5		4.5	9.8	1.0	1.0	12.5	1.0	2.5	2.5	2.5	2.5	2.5	51.3	0.86
FAS Swivel Arm Assembly	3.9	30.2		8.0	18.9	4.2	7.9	15.8	3.3	4.2	4.2	4.2	4.2	4.2	113.2	1.89
Fairlead Pad	1.3	18.0			12.8	1.5	3.3	22.8	1.5	3.8	3.5	3.5	3.5	3.5	78.8	1.31
Blank Flange	4.0	6.0			8.5	1.0	1.0	6.5	1.0	2.5	2.0	2.0	2.0	2.0	38.5	0.64
Net Frame	1.0			3.3	33.2	1.1	9.4	22.4	1.0	5.5	5.7	4.7	4.0	5.0	93.8	1.56
Stanchion Frame		20.0			11.5	1.0	3.0	10.0	1.0	6.6	6.6	6.6	6.6	6.6	82.8	1.38
Winch Safety Guard		9.0			8.0	2.0	3.0	22.0	1.0	7.0	8.5	8.5	8.0	8.5	85.5	1.43
Strainer Handle	0.4	7.6			5.6	1.6	2.9	5.2	0.9	1.6	1.6	1.6	1.6	1.6	32.4	0.54
Debarb Handrail		28.2			5.4	1.0	3.7	10.6	1.0	5.4	5.4	5.4	5.4	5.4	76.6	1.28
Handwheel (4")	2.0	10.0			10.0	1.0	2.0	6.0	1.0	1.0	1.0	1.0	1.0	1.0	37.0	0.62
Handwheel (18")		3.0			2.5	1.0	1.0	10.0	1.0	1.0	1.5	1.5	1.5	1.5	25.5	0.43
Handwheel (12")	5.0				9.0	1.0	7.0	10.0	1.0	2.0	2.0	2.0	2.0	2.0	43.0	0.72
Hatch (Large)	6.8	56.8		9.4	36.7	1.1	13.9	46.8	2.3	5.5	5.7	5.9	5.8	6.0	202.6	3.38
Hinge	2.0	12.5			8.5	1.0	3.7	4.7	1.0	1.0	1.0	1.0	1.0	1.0	38.5	0.64
Vertical Ladder		35.0			22.0	1.0	4.0	20.0	1.0	10.0	10.0	10.0	10.0	10.0	133.0	2.22
Pyro Locker		100.0			100.0	5.0	10.0	55.0	5.0	22.0	22.0	22.0	22.0	22.0	385.0	6.42
Manifold	4.2	3.6	0.1	15.7	12.7	1.2	5.1	11.0	1.1	2.4	2.0				59.2	0.99
Manifold Elbow	4.4	3.0		11.7	9.4	1.2	4.4	8.5	1.3	2.3	2.0				48.2	0.80
Big Eyes Mount	10.0	27.5		20.0	15.0	2.0	4.5	6.0	1.0	3.5	3.5	3.5	3.5	3.5	103.5	1.73
Saluting Gun Mount	16.0	60.0		15.0	40.0	1.0	4.0	42.0	2.0	9.0	12.0	12.0	12.0	12.0	237.0	3.95

Table A4-3-2 Operation Process-Element Time
Summary (Cont'd)

COMPONENT	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	PAINT Q4	PAINT Q1	PAINT Q2	PAINT Q3	PAINT Q4	PAINT Q5	TOTAL M-MIN	TOTAL M-HR
Saluting Gun Swivel	15.0	15.0		20.0	14.0	1.0	2.0	16.0	1.0	2.0	3.0	2.5	2.5	2.5	96.5	1.61
NATO Fitting	10.0	16.6		9.9	10.0	1.0	5.6	10.0	1.0	3.1	3.1	2.0	2.0	2.0	76.4	1.27
P-250 Box		60.0			60.0	1.0	10.0	15.0	1.0	10.0	10.0	10.0	10.0	10.0	197.0	3.28
P-250 Box Base		52.5			15.0	1.0	19.0	72.0	2.0	5.0	4.0	4.0	4.0	4.0	182.5	3.04
Fuel Gauge Plate		2.0			3.0	1.0	1.0	4.0	1.0	1.0	1.0	1.0	1.0	1.0	17.0	0.28
Gas Bottle Rack	10.0	40.0			47.0	1.0	12.0	37.0	1.0	6.0	6.0	6.0	6.0	6.0	178.0	2.97
Reach Rod	5.0	10.0			5.0	1.0	3.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	40.0	0.67
Reap Roller	5.0	20.0		4.0	10.0	1.0	2.0	10.0	1.0	4.0	4.0	4.0	4.0	4.0	73.0	1.22
Line Reel		43.0			38.8	1.0	18.5	43.8	1.0	7.8	7.8	7.8	8.0	7.5	184.8	3.08
Line Reel Mount	5.0	12.5			10.0	1.0	4.9	9.5	1.0	4.4	4.4	3.8	4.4	4.3	65.2	1.09
Reel Shaft Housing	4.0	3.0		4.0	3.0	1.0	0.5	3.0	1.0	0.5	0.5	0.5	0.5	0.5	22.0	0.37
Bullnose Screen	10.0	25.0			15.0	2.0	4.0	15.0	1.0	4.0	4.0	4.0	4.0	4.0	92.0	1.53
Scuttle	4.5	30.5		1.1	25.7	1.0	6.1	26.5	1.6	6.9	10.0	6.8	5.2	4.8	130.7	2.18
Three Shackles	5.0	45.0			30.0	2.0	5.0	25.0	1.0	5.0	5.0	5.0	5.0	5.0	138.0	2.30
Parking Sign		1.7			9.2	1.2	6.3	15.8	1.2	2.3	2.3	2.3	2.3	2.3	47.0	0.78
Soot Blower	6.7	23.3		10.0	10.7	1.3	4.3	18.3	1.3	2.3	1.7	4.3	4.4	4.4	60.0	1.33
Fairlead Sheave	4.4	23.6		16.3	17.8	1.8	6.0	12.6	1.0	3.5	4.4	3.1	2.5	2.4	104.3	1.74
Stanchion	1.0	15.1	4.1		9.4	1.1	4.2	9.8	1.0	3.8	3.1	2.5	2.4	1.9	59.4	0.97
Stanchion Support	1.1	16.4	24.5		8.4	1.0	4.3	6.6	1.0	1.5	1.7	1.5	1.6	1.5	71.3	1.19
Big Eyes Stand		7.0			12.0	1.0	0.5	10.0	1.0	2.0	1.5	1.5	1.5	1.5	39.5	0.66
Stopper	2.0	10.0		6.0	5.0	1.0	7.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	47.0	0.78
Stopper Roller	2.0	10.0		2.0	5.0	1.0	2.0	5.0	1.0	2.0	2.0	2.0	2.0	2.0	38.0	0.63
Strongback	10.0	25.0			15.0	1.0	3.0	15.0	1.0	5.0	5.0	5.0	5.0	5.0	95.0	1.58
MAB Support		38.0			19.0	1.0	8.0	30.0	1.0	4.0	5.0	5.0	5.0	5.0	117.0	1.95
50 Cal Tripod		25.6			15.0	1.3	6.1	13.1	1.0	4.5	4.7	4.5	4.5	4.5	88.6	1.48
50 Cal Shield		31.4			32.0	1.0	9.4	26.3	1.0	3.1	3.3	3.0	3.3	3.1	117.0	1.95
50 Cal Carriage	3.6	9.7		7.6	7.9	1.1	0.5	9.3	1.1	3.0	2.9	3.2	3.0	3.1	56.0	0.93
50 Cal Yoke	10.0	10.0		5.0	8.0	1.0	2.0	16.0	1.0	3.0	2.0	2.0	2.0	2.0	64.0	1.07
50 Cal Yoke Mount	10.0	5.0		5.0	4.0	1.0	1.0	5.0	1.0	1.0	1.0	1.0	1.0	1.0	37.0	0.62

Table A4-3-2 Operation Process-Element Time
Summary (Cont'd)

COMPONENT	SOLVENT CLEAN	STRIP BLAST	ACID/ BASE DIP	TAPE/ PLUG	ANCHOR TOOTH	QA	PREHEAT	THERMAL SPRAY	QA	PAINT 01	PAINT 02	PAINT 03	PAINT 04	PAINT 05	TOTAL H-MIN	TOTAL H-HR
1/4" Globe Valve				26.7	10.0	2.0	4.0	10.0	2.0	2.0	2.0				58.7	0.98
3/8" Globe Valve				20.0	10.0	2.0	8.0	10.0	2.0	2.0	2.0				56.0	0.93
1/2" Valve				36.8	20.4	3.2	4.8	13.0	2.6	3.0	2.8				86.6	1.44
3/4" Governor Valve	5.0			76.0	56.0	4.0	16.0	40.0	4.0	10.0	10.0				221.0	3.68
3/4" Globe Valve				21.3	13.6	1.9	3.7	9.5	1.9	1.9	1.9				55.7	0.93
1" Governor Valve	5.0			33.0	36.0	3.0	21.0	30.0	3.0	8.0	7.0				146.0	2.43
1" Reducer Valve				28.0	17.0	6.0	10.0	19.5	3.5	4.0	3.5				91.5	1.53
1" Pressure Valve				4.5	16.0	3.0	10.5	19.0	3.0	5.5	5.0				66.5	1.11
1" Globe Valve				40.0	10.0	4.0	2.0	10.0	2.0	2.0	2.0				72.0	1.20
1-1/2" Reducing Valve	0.8			20.8	17.3	1.7	7.3	15.0	1.5	3.8	3.5				71.8	1.20
2" Globe Valve				12.0	15.0	2.0	14.0	16.5	2.0	3.5	3.5				68.5	1.14
2" Reducing Valve	5.0			73.0	44.0	3.0	14.0	30.0	6.0	11.0	10.0				196.0	3.77
3" Reducing Valve	6.0	10.0		50.0	35.0	3.0	10.0	50.0	32.0	3.0	3.0				202.0	3.37
3" Feed Check Valve				45.0	69.0	3.0	13.0	25.0	3.0	4.0	4.0				166.0	2.77
3" Gate Valve	1.7	7.5		22.3	8.3	1.8	4.3	12.3	1.2	2.7	2.3				64.5	1.07
3" Regulating Valve				30.7	35.0	2.0	12.0	14.0	2.0	3.0	3.0				61.0	1.02
3" Exhaust Relief Valve	1.7	19.0		27.0	20.0	3.0	19.3	22.7	3.0	7.7	6.7				148.7	2.48
3x3-1/2" Throttle Trip Valve				10.0	9.0	1.0	4.0	7.0	1.0	2.0	1.0				83.0	1.38
4" Diaphragm Valve				24.0	15.0	1.0	5.0	10.0	1.0	3.0	2.0				35.0	0.58
5" Gate Valve		30.0		35.0	30.0	2.0	18.0	23.0	2.0	5.0	5.0				91.0	1.52
5" Main Feed Stop	5.0			69.8	61.0	6.8	25.5	30.3	3.8	8.3	7.8				125.0	2.08
5" Exhaust Relief Valve	1.3			77.0	57.5	3.0	17.0	30.0	6.0	11.0	10.0				214.3	3.57
6" Diaphragm Valve	10.0			42.0	20.0	2.0	10.0	10.0	2.0	5.0	5.0				221.5	3.69
6" Gate Valve	10.0			46.0	48.8	2.8	20.3	29.5	3.0	7.0	6.0				106.0	1.77
6" Exhaust Relief Valve	7.5			25.0	30.0	1.5	9.0	17.0	1.5	2.5	1.5				170.8	2.85
6"x4" Exhaust Relief Valve		10.0		75.0	66.7	2.7	26.3	43.0	2.7	6.3	6.0				98.0	1.63
8" Relief Valve	10.0	49.7		5.0	9.0	1.0	1.0	6.0	1.0	3.0	2.5	2.5	2.5	2.5	288.3	4.81
Fuel Oil Vent					29.0	1.3	8.0	12.0	1.0	2.3	2.3	2.7	2.3	2.3	36.0	0.60
Anchor Wrench	1.7	25.0			4.0	1.0	0.5	3.5	1.0	1.5	1.5	1.5	1.5	1.5	90.0	1.50
Boat Davit Wrench		3.0			18.0	1.0	0.5	12.0	1.0	4.0	4.0	4.0	4.0	4.0	22.5	0.38
Propeller Wrench		9.0			3.7	1.2	2.4	4.3	1.1	1.0	1.0	1.0	1.0	1.0	61.5	1.03
Light Yoke	1.1	8.1													26.7	0.45
Searchlight Yoke	4.1	15.4		3.1	9.8	1.0	2.6	5.9	1.0	2.0	2.0	2.0	2.0	2.0	32.9	0.88

2.3.3 Personal Allowances

Normal personal allowances, such as trips to the rest room and drinking fountain, typically accumulate to 20 minutes during the working day, or 5% of the normal working time. During the pilot-shop mode, however, a total of 50 minutes has been observed. A majority of this time is attributable to two additional 15-minute breaks allowed each day. These breaks, however, should be considered as shortening the working day rather than as an allowance. Treating 30 minutes in this manner thereby validates the 5% personal allowance. This allowance will be discussed further in Section A4.2.3.10.

2.3.4 Basic-Fatigue Allowance

Operation process-element times were recorded throughout the course of the day, and therefore include measurements made early in the day when high-productivity is expected as well as end-of-the-day measurements with lower productivity due to normal fatigue. For this reason, the data already compensates for fatigue and an allowance is not applicable.

2.3.5 Abnormal-Position Allowance

For similar reasons as in Section A4.2.3.4, this allowance will not be considered applicable.

2.3.6 Lighting Allowance

For the pilot shop, the lighting allowance is included in the data. For a full-production shop, equipment with improved lighting has been specified and will thereby decrease the standard times, which according to the Handbook of Industrial Engineering, would be approximately a 5% decrease (Ref. A4-3-2).

2.3.7 Noise Level Allowance

For similar reasons as stated in Section A4.2.3.6, the pilot allowance is not applicable and the estimated production-shop allowance is 2.5%. This increased productivity is primarily due to improved noise insulation on both the equipment and the building.

2.3.8 Station Preparation

Set-up time is normally not considered as an allowance allotted to each item. This time is normally expressed as a separate set-up time on the operation card. Set-up in the CC Shop includes such procedures as mixing paint, turning on the degreaser, cleaning the paint gun, suiting up for blasting, etc. This will be discussed further in Section A4.2.3.10.

2.3.9 Pilot-Shop Allowance

Due to the absence of work scheduling and manhour-allotting per job, the Pilot-Shop efficiency is below normal. Shop time is expended for shop improvement, extra paperwork and other nonproductive efforts. Under more stringent management, increased productivity would be expected. This Pilot-Shop bias is not specified in any references and can only be estimated based upon shop observation.

The Pilot-Shop allowance must also include equipment inadequacies. This factor, however, is not applicable until new equipment is utilized in shop production. This factor is also merely estimatable and must be reviewed once the equipment is actually operated.

The Pilot CC Shop also requires an allowance for an inefficient shop layout. Due to the shop space and equipment, the layout decreases the efficiency of the shop due to backtracking, lack of staging space, interferences, maneuverability difficulties, etc. In other words, given the existing equipment, it would be possible to increase productivity by providing a more-efficient equipment layout.

2.3.10 Planning Requirements

As of now, the allowances have been considered in accordance with the Handbook of Industrial Engineering. It is more important, however that the standard times suit the needs of the planner. Consistency with time standards for other shops is the main goal. These standard times are published in the SIMA(SD) Repair Time Standards Manual which is used by the majority of the SIMAs (Ref. A4-3-3).

Discussions with the SIMA(SD) Planner assigned to the CC Shop indicated that some allowances must be accounted for in a different manner than typical practices. Planning allots eight working hours per person unless time is charged to training, PMS or personal time. This requires that the allowed 30-minute break/day be allotted for in a different manner. The same is true of set-up time. By considering this time in the form of an allowance, the planner may assume the standard eight manhours-available/person/day without overloading the shop.

2.3.11 Total-Allowance Determination

In order to obtain an indication of the total shop allowance for a partial- and full-production shop, a time period was designated to collect both production-manhours available and process-element times. This data is presented in Table A4-3-3. In the process of organizing the process-element times, it became apparent that many paperwork errors existed in recording the date that the work was performed. Shop records support the fact that the work was actually performed during this period, however, the work was simply specified for a different day. Therefore, it is possible to assume that all element time standards were completed during the measurement period and the data was therefore analyzed as a period total rather than on a day-by-day basis. There were also days on which the shop failed to complete daily-assignment sheets (Figure A4-3-4). The production-manhours for these days were estimated by calculating the average manhours for that specific day throughout the period.

Table A4-3-3 Pilot CC-Shop Manpower/Element-Time Summary

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	WEEK TOTAL
DATE	5 MAY 85	6 MAY 85	7 MAY 85	8 MAY 85	9 MAY 85	10 MAY 85	11 MAY 85	
MANHOURS AVAILABLE (MHR)		52.00 *	19.00	51.00	0.00	56.00		178.00
OPERATION-PROCESS ELEMENT TIME (MHR)		16.98	7.62	13.68	1.22	4.47		43.97
PPH		3.06	2.49	3.73	0.00	12.53		4.05
DATE	12 MAY 85	13 MAY 85	14 MAY 85	15 MAY 85	16 MAY 85	17 MAY 85	18 MAY 85	
MANHOURS AVAILABLE (MHR)		74.00	49.00	53.00	70.00	43.00	0.00	289.00
OPERATION-PROCESS ELEMENT TIME (MHR)		38.42	11.85	22.63	46.43	12.92	2.90	135.15
PPH		1.93	4.14	2.34	1.51	3.33	0.00	2.14
DATE	19 MAY 85	20 MAY 85	21 MAY 85	22 MAY 85	23 MAY 85	24 MAY 85	25 MAY 85	
MANHOURS AVAILABLE (MHR)	69.00	52.00	68.00	54.00	54.00	56.00		353.00
OPERATION-PROCESS ELEMENT TIME (MHR)		30.75	5.03	37.17	0.93	13.02		86.90
PPH		1.69	13.52	1.45	58.06	4.30		4.06
DATE	26 MAY 85	27 MAY 85	28 MAY 85	29 MAY 85	30 MAY 85	31 MAY 85	1 JUN 85	
MANHOURS AVAILABLE (MHR)			52.00	40.00	12.00	48.50		152.50
OPERATION-PROCESS ELEMENT TIME (MHR)			19.98	8.55	13.18	18.07		59.78
PPH			2.60	4.68	0.91	2.68		2.55
DATE	2 JUN 85	3 JUN 85	4 JUN 85	5 JUN 85	6 JUN 85	7 JUN 85	8 JUN 85	
MANHOURS AVAILABLE (MHR)		40.00	42.00 *	47.00 *	35.00 *	53.00 *		217.00
OPERATION-PROCESS ELEMENT TIME (MHR)		13.20	1.33	2.32	0.75	7.82		15.25
PPH		15.20	31.58	20.26	46.67	6.78		14.23
DATE	9 JUN 85	10 JUN 85	11 JUN 85	12 JUN 85	13 JUN 85	14 JUN 85	15 JUN 85	
MANHOURS AVAILABLE (MHR)		52.00 *	56.00	48.00	8.00	48.00		212.00
OPERATION-PROCESS ELEMENT TIME (MHR)		3.63	5.17	0.88				9.68
PPH		14.33	10.83	54.55				21.90
DATE	16 JUN 85	17 JUN 85	18 JUN 85	19 JUN 85	20 JUN 85	21 JUN 85	22 JUN 85	
MANHOURS AVAILABLE (MHR)		45.00	56.00	35.00	40.00	53.00 *		229.00
OPERATION-PROCESS ELEMENT TIME (MHR)						3.53		3.53
PPH						15.01		64.87
DATE	23 JUN 85	24 JUN 85	25 JUN 85	26 JUN 85	27 JUN 85	28 JUN 85	29 JUN 85	
MANHOURS AVAILABLE (MHR)		44.00	51.00	48.00	61.00	64.00		268.00
OPERATION-PROCESS ELEMENT TIME (MHR)		5.20	2.75	11.83	3.92	6.43		30.13
PPH		8.46	18.55	4.06	15.58	9.95		8.89
DATE	30 JUN 85	1 JUL 85						
MANHOURS AVAILABLE (MHR)		58.00						58.00
OPERATION-PROCESS ELEMENT TIME (MHR)		6.73						6.73
PPH		8.62						8.62
TOTAL MANHOURS AVAILABLE (MHR)	69.00	417.00	393.00	376.00	280.00	471.50	0.00	1954.50
TOTAL D-P ELEMENT TIME (MHR)	0.00	104.74	53.73	97.06	66.43	66.26	2.90	391.12
AVERAGE PPH		3.98	7.31	3.87	4.21	6.36	0.00	5.00

*TIME SHEETS WERE NOT AVAILABLE FOR THIS DAY. MANHOURS AVAILABLE WERE ESTIMATED USING THE AVERAGE MANHOURS AVAILABLE ON THAT DAY THROUGHOUT THE PERIOD.

**NO PROCESS-ELEMENT PRODUCTION TIME WAS REPORTED FOR THIS DAY; HOWEVER, DAILY ASSIGNMENT SHEETS REPORTED PRODUCTION-MANHOURS AVAILABLE AND EXPENSED RESULTING IT IS ASSUMED THAT PRODUCTION DID OCCUR; HOWEVER, THE PROCESS-ELEMENT TIMES WERE REPORTED ON A DIFFERENT DAY WITHIN THIS PERIOD AND ARE THEREFORE ACCOUNTED FOR IN THE PERIOD TOTALS.

**SHOP 061
CORROSION CONTROL
DAILY ASSIGNMENTS/TIME STUDY
WORKSHEET**

NAME	Date								REMARKS
	1	2	3	4	5	6	7	8	
	Station Assignment	Shop Production	Corrective Maintenance	Military	Training	PMS	Personal Business	Other	
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									
17.									
18.									
19.									
20.									

STATION ASSIGNMENT KEY

- 0. Leave, Liberty, Tad, Etc.
- 1. Receipt, Tag, Degrease
- 2. Masking
- 3. Rough Blast Unit
- 4. Anchor Tooth Blast Unit
- 5. Wire Spray Booth
- 6. Spray Booth
- 7. Station Runner
- 8. Installation Kits
- 9. Quality Assurance
- 10. Supply
- 11. Supervisor

- 1. Fill out form daily.
- 2. Block 1 - Enter number corresponding to station assigned.
- 3. Blocks 2-8 - Enter number of man hours expended in each category.

• Explain in Remarks Column

Figure A4-3-4

Daily Assignments/Time Study Worksheet

A4-3-52

By calculating the average-manhours available during the period and dividing that number by the total of the operation-process element times, the total Pilot-Production-Allowance Factor (PPAF) was obtained. This factor is the sum of all allowances discussed in the preceding sections, i.e., transportation, personal allowances, station preparation and set-up and pilot-shop allowance.

2.3.12 Shop Adjustments to the PPAF

Due to the non-production requirements imposed during the Service Test, an allowance other than the PPAF will be required once the Pilot CC Shop is absorbed into the normal SIMA(SD) system. This factor will adjust for the decrease in data collection, contractor interference and increased emphasis in production.

Utilizing the given equipment and shop layout, the only source that would influence the productivity of the shop would be the effect of SIMA Planning. Based upon exposure to the shop operation, it is reasonable to expect that the decrease in paperwork and the emphasis on output could result in a 25% increase in production or a production allowance factor only 75% of the PPAF as shown in Table A4-3-4. Once the production shop becomes operational, additional factors increasing production would be expected due to the improved shop layout and equipment. Estimating these factors contributing 15 and 20% increases in production, a total adjustment of 0.51 and a production allowance factor of 2.55 are predicted.

Table A4-3-4 Shop Production Allowance Factor Estimate

	EQUIPMENT	LAYOUT	PLANNING	TOTAL	PRODUCTION ALLOWANCE FACTOR
Existing Shop	1.00	1.00	0.75	0.75	3.75
Production Shop	0.85	0.80	0.75	0.51	2.55

2.4 Planning Time Standards

The standard times which are the product of the estimated allowances for both the existing shop and the full-production shop and the process operation times is summarized in Table A4-3-5. These shop-loading standard times are only estimates. Future evaluation of these values is required due to the estimated allowances involved, however, these values are recommended to provide the baseline for SIMA(SD) Planning and should be included in the next edition of the Repair Time Standards Manual.

Table A4-3-5 CC Shop Standard Times

COMPONENT	PILOT SHOP OPERATION PROCESS ELEMENT TIMES (MHR)	EXISTING CC SHOP STANDARD TIMES (MHR)	PRODUCTION CC SHOP STANDARD TIMES (MHR)
Chain Bar	1.43	5.4	3.6
Baxter Bolt	0.50	1.9	1.3
J-Bolt	0.67	2.5	1.7
Accom Ladder Brace	1.25	4.7	3.2
Big Eyes Bracket	0.90	3.4	2.3
Bottle Rack Bracket	0.59	2.2	1.5
CO2 Bottle Bracket	1.14	4.3	2.9
Light Bracket/Plate	0.67	2.5	1.7
Light Bracket/Pipe	0.79	3.0	2.0
Helo Net Securing Bracket	0.26	1.0	0.7
Scupper Bracket	0.70	2.6	1.8
Sliding Padeye Bracket	0.71	2.7	1.8
Capstan Controller	1.30	4.9	3.3
Portable Cleat	1.00	3.8	2.6
Director Counterweight	0.55	2.1	1.4
Dir. Ctrwt. (Cylindrical)	2.65	9.9	6.8
Pipe Coupling	0.82	3.1	2.1
IMC Speaker Cover	1.43	5.4	3.6
BPDM5 Cable Cover	1.28	4.8	3.3
Chain Locker Cover	1.89	7.1	4.8
Chock Cover	1.12	4.2	2.9
Fuel Oil Vent Cover	0.24	0.9	0.6
Edge Light Cover	0.62	2.3	1.6
Hawse Pipe Cover	2.21	8.3	5.6
Junction Box Cover	0.63	2.4	1.6
Handwheel Cover	0.53	2.0	1.4
VDS 3-Dog Cover	0.40	1.5	1.0
Life Raft Cradle	1.25	4.7	3.2
Portable Davit	2.59	9.7	6.6
Port. Davit Socket	1.59	6.0	4.1

Table A4-3-5 CC Shop Standard Times (Cont'd)

COMPONENT	PILOT SHOP OPERATION PROCESS ELEMENT TIMES (MHR)	EXISTING CC SHOP STANDARD TIMES (MHR)	PRODUCTION CC SHOP STANDARD TIMES (MHR)
WT Door Dog	0.14	0.5	0.4
Watertight Door	3.42	12.8	8.7
WT Door (Small)	2.28	8.6	5.8
WT Door Port	0.38	1.4	1.0
Ducting	1.42	5.3	3.6
Boat Lifting Eye	0.60	2.3	1.5
FAS Bulkhead Mount	1.78	6.7	4.5
FAS Swivel	0.67	2.5	1.7
FAS Piping	1.33	5.0	3.4
FAS Swivel Arm	0.86	3.2	2.2
FAS Swivel Arm Assembly	1.89	7.1	4.8
Fairlead Pad	1.31	4.9	3.3
Blank Flange	0.64	2.4	1.6
Net Frame	1.56	5.9	4.0
Stanchion Frame	1.38	5.2	3.5
Winch Safety Guard	1.43	5.4	3.6
Strainer Handle	0.54	2.0	1.4
Debarl Handrail	1.28	4.8	3.3
Handwheel (4")	0.62	2.3	1.6
Handwheel (18")	0.43	1.6	1.1
Handwheel (2')	0.72	2.7	1.8
Hatch (Large)	3.38	12.7	8.6
Hinge	0.64	2.4	1.6
Vertical Ladder	2.22	8.3	5.7
Pyro Locker	6.42	24.1	16.4
Manifold	0.99	3.7	2.5
Manifold Elbow	0.80	3.0	2.0
Big Eyes Mount	1.73	6.5	4.4
Saluting Gun Mount	3.95	14.8	10.1

Table A4-3-5

CC Shop Standard Times (Cont'd)

COMPONENT	PILOT SHOP OPERATION PROCESS ELEMENT TIMES (MHR)	EXISTING CC SHOP STANDARD TIMES (MHR)	PRODUCTION CC SHOP STANDARD TIMES (MHR)
Saluting Gun Swivel	1.61	6.0	4.1
NATO Fitting	1.27	4.8	3.2
P-250 Box	3.28	12.3	6.4
P-250 Box Base	3.04	11.4	7.8
Fuel Gauge Plate	0.28	1.1	0.7
Gas Bottle Rack	2.97	11.1	7.6
Reach Rod	0.67	2.5	1.7
Ramp Roller	1.22	4.6	3.1
Line Reel	3.08	11.6	7.9
Line Reel Mount	1.09	4.1	2.8
Reel Shaft Housing	0.37	1.4	0.9
Bullnose Screen	1.53	5.7	3.9
Scuttle	2.18	8.2	5.6
Unree Shackle	2.30	8.6	5.9
Parking Sign	0.78	2.9	2.0
Soot Blower	1.33	5.0	3.4
Fairlead Sheave	1.74	6.5	4.4
Stanchion	0.99	3.7	2.5
Stanchion Support	1.19	4.5	3.0
Big Eyes Stand	0.66	2.5	1.7
Stopper	0.78	2.9	2.0
Stopper Roller	0.63	2.4	1.6
Strongback	1.58	5.9	4.0
MWE Support	1.95	7.3	5.0
50 Cal Tripod	1.48	5.6	3.8
50 Cal Shield	1.95	7.3	5.0
50 Cal Carriage	0.93	3.5	2.4
50 Cal Yoke	1.07	4.0	2.7
50 Cal Yoke Mount	0.62	2.3	1.6

Table A4-3-5

CC Shop Standard Times (Cont'd)

COMPONENT	PILOT SHOP OPERATION PROCESS ELEMENT TIMES (MHR)	EXISTING CC SHOP STANDARD TIMES (MHR)	PRODUCTION CC SHOP STANDARD TIMES (MHR)
1/4" Globe Valve	0.98	3.7	2.5
3/8" Globe Valve	0.93	3.5	2.4
1/2" Valve	1.44	5.4	3.7
3/4" Governor Valve	3.68	13.8	9.4
3/4" Globe Valve	0.93	3.5	2.4
1" Governor Valve	2.43	9.1	6.2
1" Reducer Valve	1.53	5.7	3.9
1" Pressure Valve	1.11	4.2	2.8
1" Globe Valve	1.20	4.5	3.1
1-1/2" Reducing Valve	1.20	4.5	3.1
2" Globe Valve	1.14	4.3	2.9
2" Reducing Valve	3.27	12.3	8.3
3" Reducing Valve	3.37	12.6	8.6
3" Feed Check Valve	2.77	10.4	7.1
3" Gate Valve	1.07	4.0	2.7
3" Regulating Valve	1.02	3.8	2.6
3" Exhaust Relief Valve	2.48	9.3	6.3
3-1/2" Throttle Trip Vlv	1.38	5.2	3.5
4" Diaphragm Valve	0.58	2.2	1.5
5" Gate Valve	1.52	5.7	3.9
5" Main Feed Stop	2.08	7.8	5.3
5" Exhaust Relief Valve	3.57	13.4	9.1
6" Diaphragm Valve	3.69	13.8	9.4
6" Gate Valve	1.77	6.6	4.5
6" Exhaust Relief Valve	2.85	10.7	7.3
6"x4" Exhaust Relief Valve	1.63	6.1	4.2
8" Relief Valve	4.81	18.0	12.3
Fuel Oil Vent	0.60	2.3	1.5
Anchor Wrench	1.50	5.6	3.8
Boat Davit Wrench	0.38	1.4	1.0
Propeller Wrench	1.03	3.9	2.6
Light Yoke	0.45	1.7	1.1
Searchlight Yoke	0.88	3.3	2.2

REFERENCES for APPENDIX A4-3

- A4-3-1 SIMA, San Diego, Process Instruction No. 7100-18-84 Rev. 1 (September 1985), Wire-Sprayed Aluminum (WSA) for Corrosion Protection; NAVSEA Corrosion-Control (CC) Systems 1 and 2.
- A4-3-2 Gavriel Salvendy, John Wiley & Sons, 1982.
- A4-3-3 SIMA San Diego Repair Standards, Thirteenth Revision, 3 April 1985.

APPENDIX A4-4

PRODUCTION CC-SHOP CONSUMABLES LISTING

1.0 GENERAL

In order to maintain shop production, a variety of supplies are required. A record of supplies ordered by the Pilot CC Shop served as a basis in the formation of a recommended inventory list for a full-production shop.

2.0 DATA COLLECTION

Monthly listings of all supplies ordered by the Pilot CC Shop were collected and summarized. Unnecessary supplies and supplies not associated with actual production were eliminated from the list so that the list contained only those supplies required for CC-shop operation. This data was then averaged over the period to provide a minimum inventory requirement specified on a monthly basis for the Pilot CC Shop.

3.0 CONSUMABLES REQUIRED FOR FULL-PRODUCTION SHOP

The Pilot CC-Shop Consumables Listing was extrapolated to reflect the necessary supplies to sustain full production (approximately three times the pilot-shop production). This list (Table A4-4-1) should serve only as a basis in future CC-shop establishment and should be modified depending on regional availability and delivery times. In addition to minimum recommended inventories, the table provides estimated consumption rates, typical supply sources, national stock numbers (NSNs) and approximate costs.

TABLE A4-4-1
CORROSION-CONTROL-SHOP CONSUMABLES

ITEM	MINIMUM INVENTORY	CONSUMPTION RATE	SOURCE	NSN	APPROXIMATE COST
STAGE 1 - RECEIVING					
I.D. Tags	1000	1/Item	NSN	0116-LF-890-9020	\$ 8.00/pkg
Electrical Ties	20 Pkgs	1/Item	NSN	5975-00-074-2072	\$.97/pkg
Dog Tags	1000	1/Item	NSN	8465-00-242-4804	
Shower Clips	1000	1/Item	NSN	7230-00-252-3384	\$ 3.29/box
STAGE 2 - DEGREASING					
Respirator Charcoal Filters	50	1/Day	Safety		
Trichloroethane	230 Gal.	As Req'd	NSN	6810-00-531-1487	\$217.14/drum
Trichloroethane Spray Can	40 Cans	As Req'd	NSN	6810-00-930-6311	\$ 1.16/can
Rubber Gloves/Apron	5 Pairs	As Req'd	NSN		
Rags	As Req'd	As Req'd	NSN		
STAGE 3 - MASKING					
Masking Tape	20 Rolls	As Req'd	NSN		\$ 1.62/roll
Duct Tape - 1/2"	40 Rolls	As Req'd	NSN	8315-00-890-9872	\$ 4.04/roll
Duct Tape - 2"	50 Rolls	As Req'd	NSN	8315-00-074-5100	\$ 32.63/roll
Aluminum Tape	25 Rolls	As Req'd	O/P*		
Plugs (Various Sizes)	1000 Ea.	As Req'd	O/P*		
Utility Blades	20 Boxes	As Req'd	NSN	8530-00-162-5629	\$ 2.44/box
STAGE 4 - STRIP BLASTING					
#36 Garnet Sand	10,000 Lbs.	600 Lbs/20 Min*	O/P*		\$.20/lb
Face Shields (Disposable)	500	As Req'd	O/P*		\$.24-\$.50/ea
Ear Plugs	5 Boxes	As Req'd	NSN		

* Open Purchase

TABLE A4-4-1
CORROSION-CONTROL-SHOP CONSUMABLES (Cont'd)

ITEM	MINIMUM INVENTORY	CONSUMPTION RATE	SOURCE	NSN	APPROXIMATE COST
STAGE 5 - ANCHOR-TOOTH BLASTING					
#16 Aluminum-Oxide Grit Press-O-Film (X-Coarse) Gloves (Rubber) Face Shields (Disposable)	12,000 Lbs. 25 Rolls 20 Pairs 500	600 Lbs./20 Min.* 1/Item As Req'd As Req'd	O/P* O/P* O/P* O/P*		\$.45/lb \$ 23.00/roll \$ 24-\$50/ea
STAGE 6 - ALUMINUM-WIRE SPRAYING					
1/8" Aluminum Wire Oxygen Acetylene Gloves (Cotton) Dust Filter (Yellow Button)	5 Rolls (100 Lbs.) 20 Bottles 15 Bottles 60 Pairs 5 Boxes	12 Lbs./Hr. 83 scfh 40 scfh As Req'd As Req'd	O/P* NSN NSN NSN Safety	6830-00-169-0805 8120-00-268-3360 8415-00-268-8318	\$.06/cf \$.09/cf \$ 1.40/pr
STAGE 7 - PAINTING					
Respirator Charcoal Filters Cheese Cloth (Strainer) TT-E-781 EGM Thinner Formula 150 - Green Primer Formula 151 - Haze Gray Topcoat Deck Formula 20 - Exterior Gray TT-E-490 - White Enamel TT-E-490 - Haze Gray Enamel DoD-P-24555(SH) - Heat-Resisting Paint MIL-D-23003 - Type III - Non-Skid Deck Coating Gloves (Plastic)	50 3 Rolls 60 Gal. 130 Gal. 150 Gal. 30 Gal. 10 Gal. 60 Gal. 50 Gal. 5 Gal. 150 Pairs	1/Day As Req'd As Req'd As Req'd As Req'd As Req'd As Req'd As Req'd 5 Gal/Use As Req'd	Safety NSN NSN NSN NSN NSN NSN NSN NSN NSN NSN	8305-00-170-5063 6810-00-222-2751 8010-00-437-6757 8010-00-410-8460 8010-00-286-9083 8010-00-145-0165 8010-00-917-2256 8010-01-033-3778 8010-01-033-3778 6515-01-149-8842	\$ 12.36/roll \$ 25.21/5-gal \$107.68/10-gal \$205.00/10-gal \$ 40.43/5-gal \$ 53.40/5-gal \$ 92.05/5-gal

TABLE A4-4-1
CORROSION-CONTROL-SHOP CONSUMABLES (Cont'd)

ITEM	MINIMUM INVENTORY	CONSUMPTION RATE	SOURCE	NSN	APPROXIMATE COST
STAGE 8 - INSTALLATION KIT DISTRIBUTING					
316 Stainless Steel	As Req'd	As Req'd	O/P*		
Fastener Assemblies	As Req'd	As Req'd	O/P*		
Ceramically-Coated	As Req'd	As Req'd	O/P*		
Fastener Assemblies	As Req'd	As Req'd	O/P*		
Nylon Washers	3 Rolls	As Req'd	O/P*		\$2.10-\$15.62/100
Neoprene with Cloth Reinforcement	30 Tubes	As Req'd	NSN	8030-00-292-1102	\$ 7.02/ft
Anti-Seize Compound	9 Cans	As Req'd	NSN	8050-00-762-8807	\$ 1.56/Tube
Polysulfide Sealant, Type I	9 Cans	As Req'd	NSN	8030-00-871-8489	\$ 36.38/can
Polysulfide Sealant, Type IV	5 Boxes	As Req'd	O/P*		\$ 26.91/box
Plastic Bags					

APPENDIX A4-5

SIMA, SAN DIEGO, CORROSION CONTROL WORK-ACCOMPLISHED INFORMATION BOOK

1.0 GENERAL

The SIMA, San Diego, Corrosion-Control Work-Accomplished Information Book has been developed to provide the information required by both SIMA and the serviced ships. The book is divided into four main sections as described in the following paragraphs. Attached is an example of the CC Work-Accomplished Information Book for the USS COPELAND (FFG-25).

2.0 CORROSION DISCUSSION

This section of the book provides a summary of the corrosion discussion provided in the NAVSEA Ship Class CC Manuals, the types of corrosion and the corrosion mechanisms most commonly found on ships. This information was developed primarily for the Ship's CC Coordinator to give him the ability to perform simple "diagnosis" of shipboard corrosion and "prescribe" corrosion prevention and control methods aboard ship.

3.0 CORROSION PREVENTION SYSTEMS

This section of the CC Work-Accomplished Information Book provides a brief explanation of the 15 NAVSEA-designated corrosion prevention and control systems. The applications of each system are detailed in addition to use, maintenance and repair instructions. Each system has been once again written to aid the ship's CC Coordinator and summarizes this section of the Ship Class CC Manuals.

4.0 ITEMS PRESERVED

This section identifies the items preserved and the corrosion-prevention services provided. Each item is listed alphabetically along with its location and the corrosion-control services it received. Remarks are included relevant to degraded coating/installation so the follow-up corrections may be made as a result of the CC Shop final inspection. The items are also identified on plot plans of the weather decks to aid in locating the specific items.

5.0 APPENDIX

This section of the book provides an Indoctrination (I) Division Brief and Handout, a Pre-Selected-Restricted-Availability (Pre-SRA) Plan-of-the-Day (POD) Note, a Post-SRA POD Note and a routine POD Note Reminder. These have been provided in order to aid the ship in preparing and maintaining their corrosion prevention package.

6.0 USES OF THE BOOK

The SIMA, San Diego, Corrosion-Control Work-Accomplished Information Book was designed to be a multi-purpose guide for the following individuals to provide technical and accountability information.

6.1 SIMA CC Planner and CC Shop Master

The book aids the CC planner and CC Shop master in identifying previously-preserved items. This will allow the CCWP to be more accurately defined, screened and avoid extensive delays in Shop production by minimizing the occurrences of components being sent to CC Shop that had previously been coated. (This occurred often during the Service Test.) This will also aid in identifying work performed by other naval facilities and/or outside contractors.

6.2 Ship CC Coordinator

The ship's CC Coordinator also requires previously-preserved items to be identified in order to instruct S/F in the proper maintenance of these items. It is also essential in the screening of items to be preserved during future availabilities according to their suitability and need.

The book also provides the ship's CC Coordinator with a prewritten "I" Division Brief and Handout to ensure that all essential information is presented to S/F. POD Notes are provided for all phases of the CC Availability in order to provide necessary maintenance and repair instructions to S/F.

**SIMA, SAN DIEGO
CORROSION-CONTROL WORK ACCOMPLISHED
INFORMATION BOOK**

**FOR THE
USS COPELAND
(FFG-25)**

**During the
5 February to 5 April 1985
SRA**

30 April 1985

**Integrated Systems Analysts, Inc.
222 West 24th Street
National City, California 92050**

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SECTION I

INTRODUCTION

1.1 BACKGROUND

There is a continuing need to reduce the maintenance work load on ship's force (S/F) personnel, to improve the readiness and operability of shipboard equipments and to increase the service life of the ship structures and shipboard equipments. The marine atmosphere is a severely-corrosive environment causing the oxidation of steel (rust) and other materials and galvanic corrosion due to the salt-water electrolyte. COMNAVSURFPAC and COMNAVSEASYS COM (NAVSEA) initiated a program in 1977 to develop and deliver improved corrosion prevention and control (CPAC) coatings. NAVSEA has designated 15 systems to prevent and control shipboard corrosion, ranging from metallized coating with an expected life of 7 years to strippable coatings with a one-time useful life. These improved CC systems are now being used in new ship construction and in the maintenance, repair and overhaul of ships-in-service. The Ship Class Corrosion Control Manuals and NSTM Chapters 631 and 634 are the primary S/F references for these improved coatings.

SIMA, San Diego, has established a Pilot Corrosion-Control (CC) Shop, Shop 06I, to deliver CPAC services for tended ships. Shop 06I delivers:

- Technical advice on the causes and prevention of topside corrosion problems and the application of the 15 NAVSEA systems and
- Production services for

	<u>NAVSEA CC System</u>
.. Wire-sprayed aluminum (WSA) with either high- or low-temperature paint schedule.	1 & 2
.. Electrostatically-sprayed powder coating (PC).	4
.. Installation Kits for items preserved with WSA or PC	6 to 15

1.2 OBJECTIVE

The objective of this report is to develop a method for documenting the CPAC services delivered by the SIMAs to their customer ships, one element of the management control and accountability to deliver quality CPAC services.

Note: This report is the first attempt to record CPAC services delivered. Evaluation and feedback will improve the content and format of subsequent reports.

1.3 SCOPE

The scope of this report includes:

- Technical summary of the 15 NAVSEA corrosion prevention and control systems,
- Record of the CC services delivered, and
- Instructions on the use or maintenance and repair of the 15 NAVSEA-approved corrosion-control systems.

SECTION 2

CORROSION DISCUSSION

2.1 GENERAL

Corrosion can be defined as the process by which material returns to its natural state. The metals used in ship construction have been refined to a more useful state, which in most cases is unstable. Through exposure to the environment, these metals revert to their natural state by forming stable chemical compounds, such as steel reacting with the oxygen in the air or water forming iron oxide or rust.

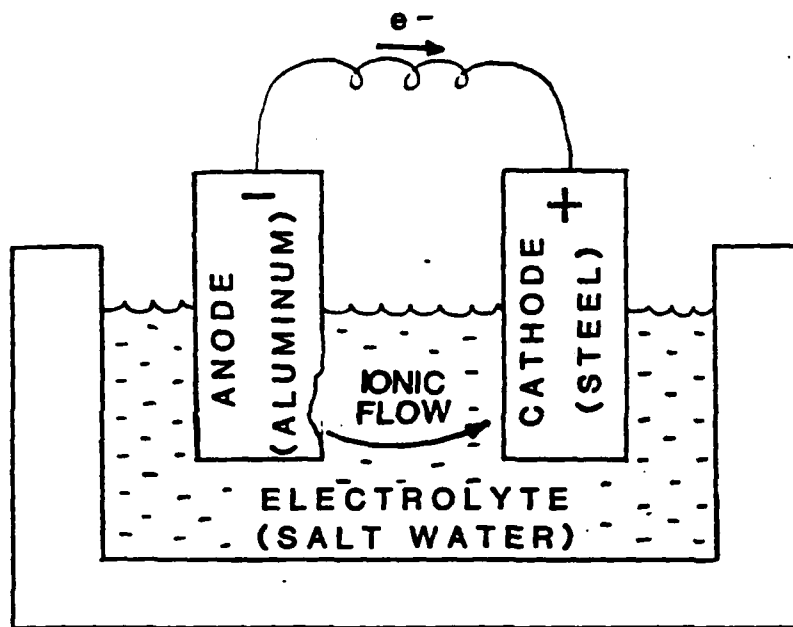
For corrosion to occur, four elements must be present:

- a. a metal which is susceptible to corrosion, called the anode;
- b. a second metal which is less susceptible to corrosion and therefore does not deteriorate, called the cathode;
- c. a metallic path for electrical contact between the two metals;
- d. and a liquid solution which is capable of carrying an electrical current between the two metals, called the electrolyte.

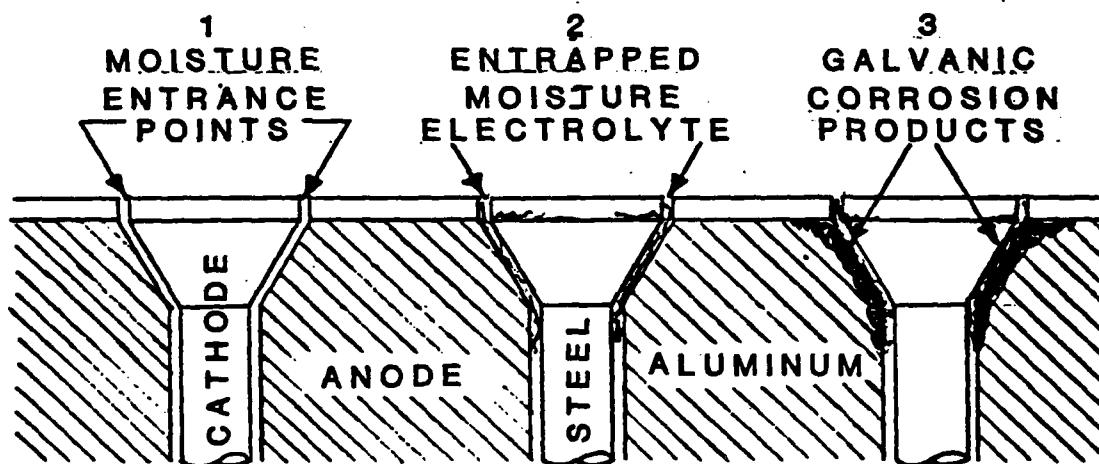
The corrosion process occurs when a current flows from the anode to the cathode through the metallic path due to a voltage potential difference between the anode and cathode as illustrated in Figure 2-1. This is the basic structure of a battery. The rate and extent of corrosion are dependent upon:

- The ratio of the anode and cathode areas.
- Surface films.
- Applied or residual stresses.
- Concentration and type of ions in the electrolyte.
- Operating temperature.
- Voltage potential difference between the anode and cathode.

The voltage potential difference between two dissimilar metals in a marine environment is illustrated in Table 2-1. This galvanic series ranks metals by their tendency to corrode with the most corrosion-prone being at the top of the list. The farther apart two metals are listed, the greater the difference in electrochemical potential and susceptibility to corrode. As an example, mild steel has a voltage of -0.6 to -0.7 volts from the galvanic chart. Aluminum alloys can have a voltage of -0.8 to -1.0 volts. The resulting voltage difference when these two metals are in contact as shown in Figure 2-1b can be as great as 0.4 volts.



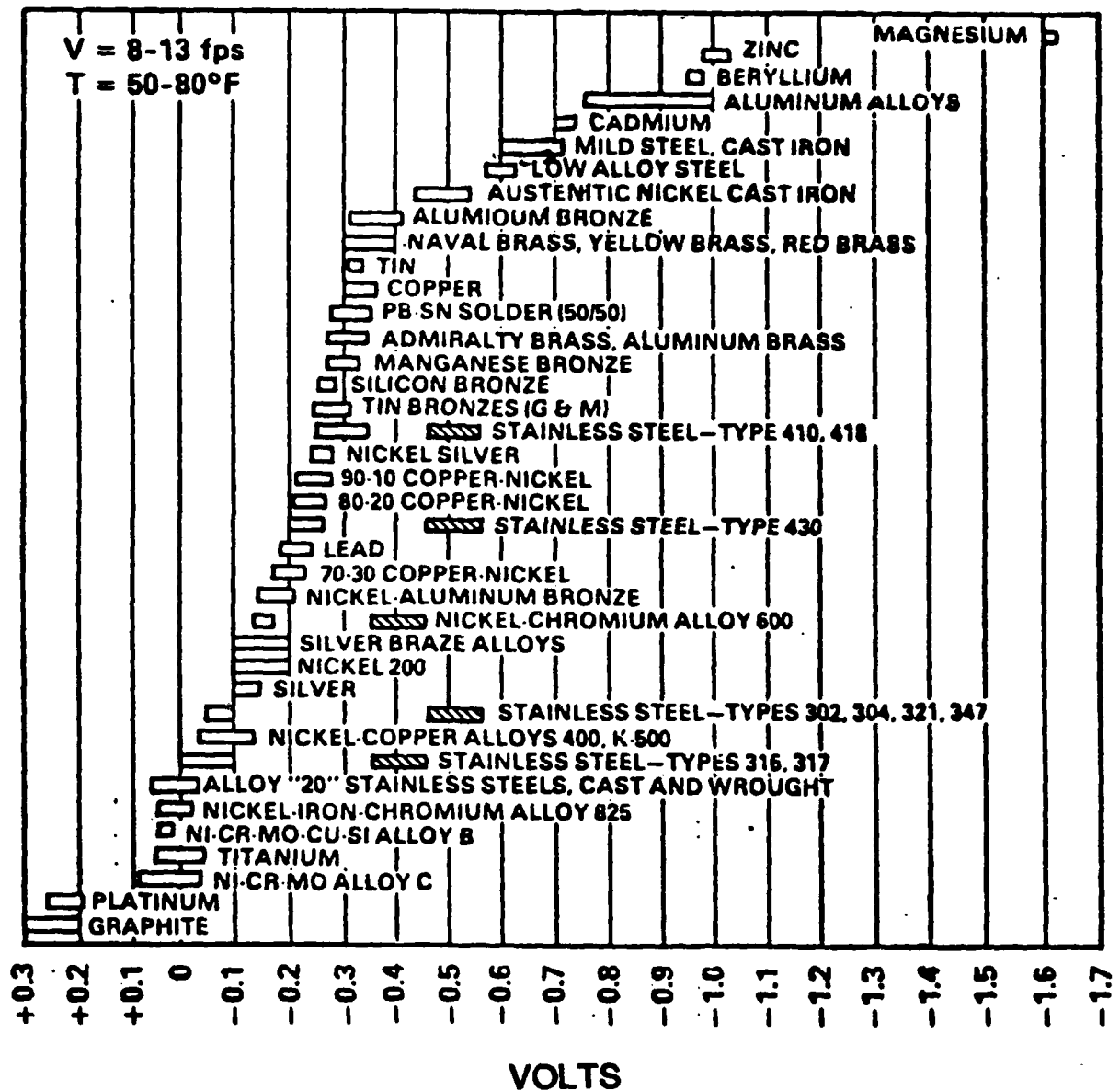
a) BASIC BATTERY STRUCTURE



b) STAGES OF GALVANIC CORROSION ONBOARD SHIP

FIGURE 2-1 GALVANIC CELLS

TABLE 2-1 GALVANIC SERIES (SEA WATER)



In an attempt to control or eliminate corrosion, there are various methods to eliminate one of the four essential elements, such as:

- Breaking the electrical path between the anode and cathode by applying a barrier film, such as paint or installing insulating tape or gaskets.
- Reducing the voltage potential difference between the anode and cathode by strategically selecting metals or coatings.

2.2 TYPES of CORROSION

2.2.1 General

There are several forms and types of corrosion; however, not all commonly occur in the topside areas of ships. The typical forms are uniform attack, galvanic corrosion and pitting.

2.2.2 Uniform Attack

The simplest form of corrosion is uniform chemical attack resulting from the direct reaction of a metal surface with oxygen in the air. It is characterized by relatively uniform degradation over large areas of the metal. In this form of attack, the anode and cathode are both located upon the surface of the material itself and change locations so that the corrosion products build up on the entire surface. Rusting of iron and tarnishing of silver are common examples of uniform corrosion.

2.2.3 Galvanic Corrosion

Galvanic corrosion occurs when two dissimilar metals are in contact and joined by an electrolyte as described in Section 2.1. This situation arises frequently onboard ship when steel studs, or bolts and nuts, are used to fasten aluminum structural members in order to obtain adequate strength. The steel and aluminum form a galvanic cell if they become joined by salt water, spray or salty sea air.

An important consideration in galvanic corrosion is the relative sizes of the anode and cathode. The greatest damage occurs when the anode is much smaller than the cathode, creating a very high current density in the attacked metal. For this reason, fastener material should be strategically selected in order to avoid extensive corrosion of these small items.

2.2.4 Pitting

Pitting is a severe form of localized corrosion, which is especially common in steel, stainless steel and aluminum. The source of pitting may be various metals within an alloy forming local galvanic cells or small areas of exposed metal due to incomplete films or coatings, such as paint damage. Severe pitting often occurs at the waterline where a metal is partially underwater and partially exposed to the atmosphere. Complete penetration of thin metal sheets is quite common and can result in loss of structural integrity with only a small loss of metal.

2.3 EFFECTS of CORROSION on METALS

2.3.1 General

Although the exterior superstructure and fittings are made up of numerous metals, this section will cover only the most common steel, stainless steel, brass and aluminum.

2.3.2 Steel

Steel is used virtually throughout the structure of the ship as well as for equipment. Rust is the characteristic corrosion product of steel. Rust will appear on painted steel surfaces where the paint surface is broken. The steel underlying rust may be blackened as well as rusted. If the corrosion is allowed to continue, a red to black scale will form which may be flaked off. The primary consideration in removing rust from steel is that the removal be complete and as early as possible. The formation of rust will cause lifting and blistering of the surrounding paint which allows continuation of corrosion. This process will continue until all rust and moisture are removed and the area is sealed with an effective topcoat system.

2.3.3 Stainless Steel

Stainless steel, frequently referred to as corrosion-resistant steel (CRES), is found in some topside fittings, label plates, and fasteners. The distinctive characteristic of stainless steel is a 12% or greater content of chromium. Chromium and nickel, the principle alloying elements in stainless steel, are mixed with iron and specially heat treated to produce one of the most corrosion resistant metals. Their corrosion-resistant characteristic is due to the formation of a protective oxide film on their surface. Treatment with chemicals, a process known as "passivation", reinforces the film.

Stainless steels in a marine environment corrode most frequently by pitting, particularly in crevices where salt or other foreign materials can collect. The best preventive maintenance action to curtail pitting is to keep the stainless steel surface clean; barring that, CRES (316SS) may be protected by topcoat application.

2.3.4 Brass

Brass is a copper-base alloy which is used for such items as some light assemblies, fog applicator nozzles, ship's bells and turnbuckles. Corrosion of brass can be seen as a green coating called "verdigris" or copper chloride. Treatment is to remove the copper chloride surface discoloration.

2.3.5 Aluminum

Aluminum alloys are the primary metals used in the superstructure and masts because of their strength-to-weight ratio. They are subject to various types of corrosion and must be protected in the marine environment. Corrosion of aluminum starts where there is any break in the paint surface. In the early stages, a white-gray corrosion product will appear in the damaged areas. The powdery material will grow and the aluminum will appear etched or mottled in the area. As in the case of steel, it is very important that the corrosion be removed before represervation is begun. The corrosion product can be removed by mechanical means, such as a stainless steel brush or abrasive paper. A carbon steel brush or steel wool should not be used on aluminum. No matter how much care is taken, particles of dissimilar metal will become embedded in the aluminum and cause further corrosion. The relatively soft surface of the aluminum is also susceptible to easy damage by power-assisted scalers or chippers which must be used with care. Aluminum will not withstand heavy concentrations of either acids or bases, such as strong caustic cleaning solutions or paint removers.

SECTION 3

CORROSION PREVENTION SYSTEMS

3.1 GENERAL

This section provides detailed explanations of the fifteen surface preservation systems which are recommended for use in treating or preventing corrosion problems. Proper use, maintenance and repair procedures, which are essential to maintain a successful corrosion-control system, are also included.

3.2 APPROVED CORROSION PREVENTION SYSTEMS

3.2.1 General

The systems listed here as preservation systems are not limited to conventional paints, but include other applications which prevent corrosion by establishing a barrier to screen out corrosive elements or sacrificially corrode themselves to protect the metal substrate. The systems are varied in nature and in addition to paint systems (such as silicone alkyd and polyamide epoxy), include such items as metallic coatings of Wire-Sprayed Aluminum (WSA), preventive compounds (such as polysulfide sealants and strippable coatings), improved corrosion-resistant fasteners and anti-seize compound.

SYSTEM NUMBER

METHOD

1	WSA-High Temperature (>175°F) + Heat-Resistant Aluminum Sealer and Topcoat
2	WSA-Low Temperature (≤175°F) + Epoxy Polyamide Sealer and Barrier Coats + Silicone Alkyd Topcoats
3	Coating Systems
4	Electrostatically-Sprayed Powdered Coatings
5	Non-Skid Deck Coating (Navy approved)
6	Ceramic Coatings (MIL-C-81751)
7	Water-Displacing, Clear, Corrosion-Preventive Compound
8	Thread Compound; Anti-Seize Compound (MIL-T-22361)
9	Improved Fasteners

SYSTEM NUMBER**METHOD**

10	Sealing and Coating Compound
11	Polysulfide Sealant on Faying Surfaces
12	Protection of Electrical Connectors
13	Plastic Dielectric Barrier
14	Vapor-Phase Inhibitor (VPI) (MIL-I-22110)
15	Strippable Coatings

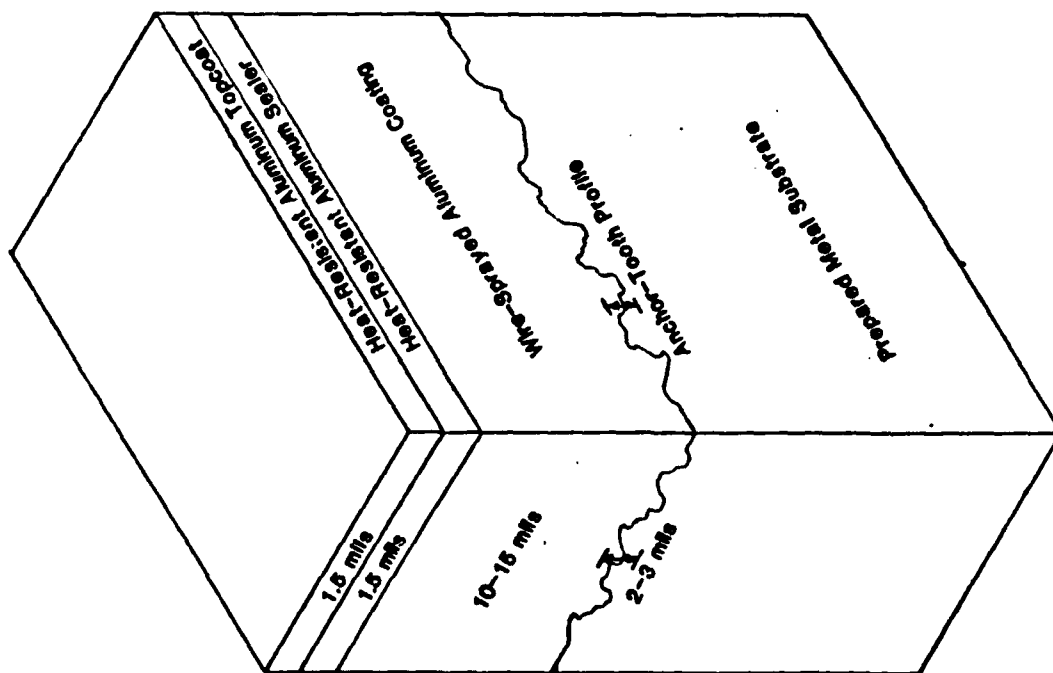
3.2.2 System One: Wire-Sprayed Aluminum with Heat-Resisting High-Temperature Sealer (DoD-STD-2138(SH))**3.2.2.1 General**

This system is required for the protection of steel where high temperatures are expected, specifically in a shipboard component where temperatures over 175°F are continuous or intermittent.

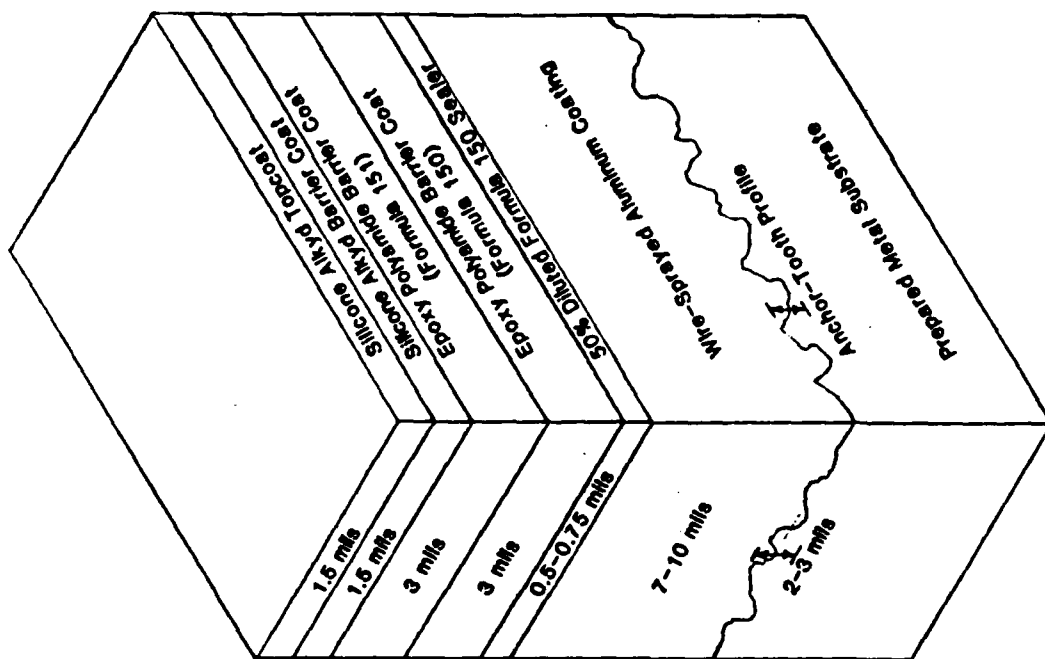
In this system, a coating of pure aluminum metal is deposited on the surface to be protected by spraying in a molten state. This coating of aluminum is then sealed and covered with a heat-resisting paint. The resultant coating system protects against corrosion. The aluminum forms a galvanic coating which becomes the base for the sealing system, without which it cannot be used successfully. The expected service life of the Wire-Sprayed Aluminum (WSA) Coating is at least seven years in most applications.

The aluminum-spraying process is controlled by a hand-held, flame spray gun. The pure aluminum, in the form of a 1/8-inch wire, is drawn into the gun by a turbine turned by compressed air. The gun is supplied with controlled compressed oxygen and acetylene which combine in the gun and burn to form the flame necessary to melt the aluminum. The molten aluminum is propelled to the surface by a stream of compressed air, flattened and formed into thin platelets (splats) which conform and adhere to the irregularities of the previously-prepared surface, as well as to each other. As the sprayed particles impinge on the substrate, they cool and build up, particle by particle, into a lamellar-coating structure.

For high-temperature applications, the WSA is applied to a white-metal blasted surface with a 2- to 3-mils anchor-tooth profile at a thickness of 10 to 15 mils. This aluminum layer is then sealed and coated with two coats of heat-resistant aluminum paint (DoD-P-24555), 1.5 mils DFT per coat as shown in Figure 3-1a. The first sealing coat shall be applied as soon as practical but not later than four hours after of spraying. DoD-STD-2138(SH) is the governing document for WSA application.



a) WIRE-SPRAYED ALUMINUM - HIGH TEMPERATURE



b) WIRE-SPRAYED ALUMINUM - LOW TEMPERATURE

FIGURE 3-1 SYSTEMS 1 & 2: WIRE-SPRAYED-ALUMINUM COATING SYSTEMS

3.2.2.2 Applications

A metal-sprayed-coating system is intended for applications on surfaces that are intermittently submerged or are subjected to high humidity such as engineering spaces and salt-spray environments as well as for dissimilar-metal junctions. System I metal-sprayed coating is approved by NAVSEA for the following areas and components:

Category 1. Machinery space components. - High temperature per DoD-STD-2138(SH).

foundations/bedplates
steam valves, piping and traps

3.2.2.3 Maintenance and Repair

DO NOT CHIP OR WIRE BRUSHSM

WSA coated equipment must be handled carefully in order to avoid chipping or stripping the coating from the substrate. Periodic painting will be required for appearance purposes only. Should chipping, blistering or peeling of the paint or coating occur, the area should be repaired as soon as possible.

The correct repair procedure for WSA coated items consists of the following steps:

- The area shall be mechanically cleaned with a stainless-steel-wire brush to the first layer of sound paint or coating.
- The edges of the damaged area shall be "feathered" as shown in Figure 3-2 with #80 grit aluminum oxide or garnet sandpaper.
- The area shall be cleaned with an approved solvent to remove all moisture, oil and dust.
- The surface shall be recoated following the appropriate paint system procedure from NSTM 631.

3.2.3 System Two: Wire-Sprayed Aluminum with Low-Temperature Sealer **(DoD-STD-2138(SH))**

3.2.3.1 General

System Two is used for the corrosion protection of steel components whose operating temperature is less than 175°F. In this system, a coating of pure aluminum metal is deposited on the surface to be protected by spraying in a molten state. The coating of aluminum is then covered with a thin coat of diluted Formula 150 and a topcoat system. The resultant coating system protects against corrosion. The aluminum forms a galvanic coating which becomes the base for the sealing and topcoat system, without which it cannot be used successfully topside. Expected service life of the Wire Sprayed Aluminum (WSA) Coating is at least seven years in most applications.

The aluminum-spraying process is controlled by a hand-held, wire spray gun. The pure aluminum, in the form of a 1/8-inch wire, is drawn into the gun by a turbine turned by compressed air. The gun is supplied with controlled compressed oxygen and acetylene which combine in the gun and burn to form the flame necessary to melt the aluminum. The molten aluminum is propelled to the steel surface by a stream of compressed air, flattened and formed into thin platelets (splats) which conform and adhere to the irregularities of the previously-prepared surface, as well as to each other. As the sprayed particles impinge on the substrate, they cool and build up, particle by particle, into a lamellar-coating structure. The aluminum coating, shown in Figure 3-1b, is sealed with low-temperature sealer and topcoated with various coatings.

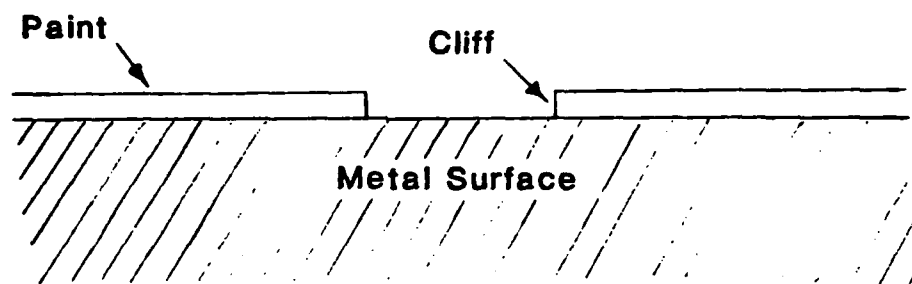
For low-temperature applications, the WSA is applied to a white-metal-blasted surface with a 2- to 3-mils anchor-tooth profile at a thickness of 7 to 10 mils. The aluminum layer is then sealed with one thin coat of 50% diluted Formula 150 as soon as practical within four hours of application of WSA. This coating of sealer should be 0.5 to 0.75 mils thick applied per MIL-P-24441. The sealer is followed by epoxy-polyamide paint barrier coats (MIL-P-24441). The first coat (typically Formula 150 of MIL-P-24441) of the selected coating system shall be applied within 4 hours after the sealer coat has dried (coating should be dry to the touch in less than 7 hours). DoD-STD-2138(SH) is the governing document for WSA application.

3.2.3.2 Applications

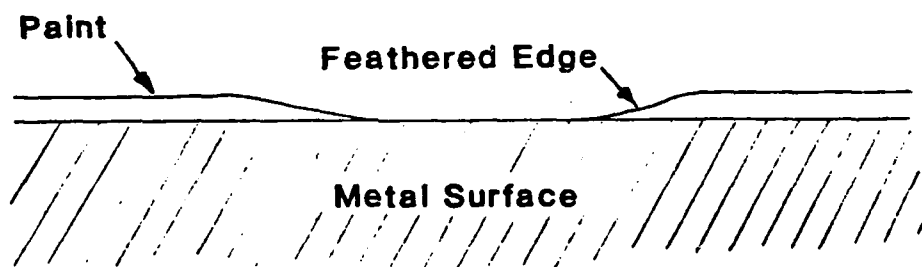
A metal-sprayed-coating system is intended for applications on surfaces that are subjected to high humidity such as engineering spaces, salt-spray environments, or are intermittently submerged as well as for dissimilar-metal junctions. System 2 metal-sprayed coating is approved by NAVSEA for the following areas and components:

Category II. Topside weather equipment. - Low temperature per DoD-STD-2138(SH).

- low-pressure air piping
- aircraft tie downs
- water way bar; deck 6 inches either side
- stanchions
- scupper brackets
- machinery casings and foundations/bedplates
- chocks, bitts and cleats
- pipe hangers
- capstans/gypsy heads (except wear area)
- rigging fittings (blocks and hooks)
- fire station hardware
- lighting fixtures and brackets



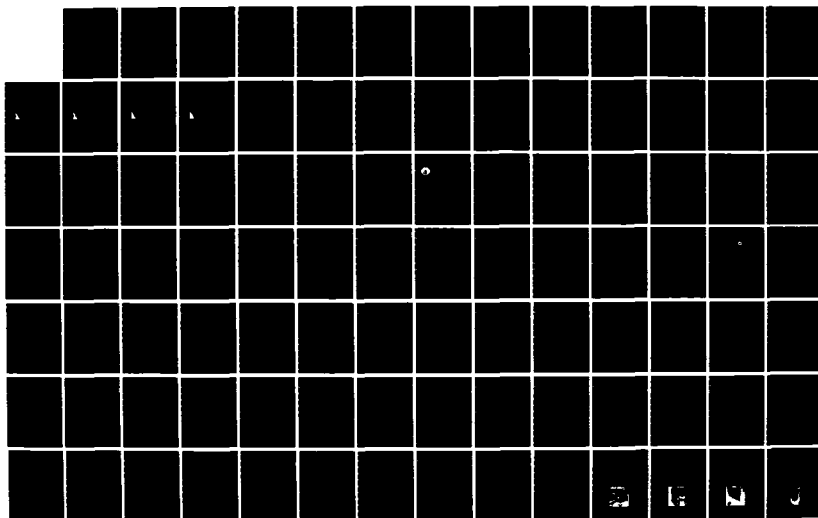
a) UNFEATHERED

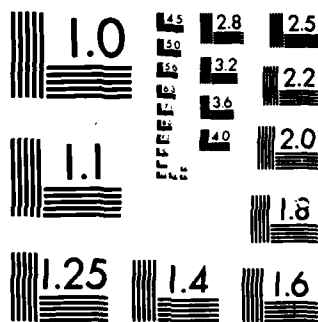


b) FEATHERED

FIGURE 3-2 FEATHERING EDGES OF EXISTING PAINT

AD-A163 671 CORROSION-CONTROL (CC) PROGRAM SIMA (SHORE INTERMEDIATE 3/5
MAINTENANCE ACTIV. (U) INTEGRATED SYSTEMS ANALYSTS INC
NATIONAL CITY CA W ADKINS ET AL. 30 NOV 85
UNCLASSIFIED ISR(MC)-107-VOL-2 N66081-85-C-0350 F/G 11/6 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Category III. Interior wet spaces. - Low temperature per DoD-STD-2138(SH).

wash room and water closet decks
pump room decks and equipment support foundations
ventilation plenum intakes and support structure
fan room equipment support foundations, and 12 inches up the bulkheads
water heater room decks and equipment support foundations
air conditioning equipment support
engine room and auxiliary room deck plate supports
deck plate supports
machinery foundations/bedplates
washing machine and sink foundations
food service areas, scullery, garbage grinder rooms, decks and equipment support foundations

3.2.3.3 Maintenance and Repair

DO NOT CHIP OR WIRE BRUSH⁰⁰⁰

WSA coated equipment must be handled carefully in order to avoid chipping or stripping the coating from the substrate. Periodic painting will be required for appearance purposes only. Should chipping, blistering or peeling of the paint or coating occur, the area should be repaired as soon as possible.

The correct repair procedure for WSA coated items consists of the following steps:

- The area shall be mechanically cleaned with a stainless-steel-wire brush to the first layer of sound paint or coating.
- The edges of the damaged area shall be "feathered" as shown in Figure 3-2 with #80 grit aluminum oxide or garnet sandpaper.
- The area shall be cleaned with an approved solvent to remove all moisture, oil and dust.
- The surface shall be recoated following the appropriate paint system procedure from NSTM 631.

3.2.4 System Three: Coating Systems

3.2.4.1 General

System Three consists of the paint systems which are used in the recoating of topside areas. The coating systems encompass primers, barrier coats and topcoats. The type, number and thickness of each coat is determined by the substrate material and the location of the item to be coated. For information concerning coating-substrate combinations, referral should be made to NSTM Chapter 631, "Preservation of Ships in Service".

The topcoat system which is used as the standard coating system is the epoxy-polyamide paint (MIL-P-24441). The paint is designed to provide a high-dielectric, hard, durable, chemical-resistant and nonporous coating. The coating provides a superior barrier and exceptional service in wet spaces. The epoxy polyamide paint system differs from conventional paints in that each formula consists of two components (polyamide marked Component A and an epoxy marked Component B) which must be mixed together.

3.2.4.2 Applications

Locations to be painted shall be in accordance with NSTM 631.

3.2.4.3 Maintenance and Repair

Periodic touch-up of paint will be required due to fading and damaging during normal operation. The proper procedure for painting consists of the following:

- Determine if the item has been WSA coated or powder coated.
- Follow the appropriate surface preparation and painting procedures.
 - .. For WSA-coated items, follow the steps listed in Section 3.3.2 of this report.
 - .. For powder-coated items, follow the steps listed in Section 3.3.4 of this report.
 - .. For non-coated items, follow the procedures provided in NSTM 631.

3.2.5 System Four: Electrostatically-Applied Powdered Coatings

3.2.5.1 General

Powdered coatings are approved for interior and exterior application on steel surfaces above the upper limit of boot topping. Powdered-coating systems are used in areas difficult to maintain if using traditional coatings, and subject to severe moisture, wear, and abrasion. The coating is applied in powdered form by electrostatic deposition and fused on to the surface of the metal. Coating thickness can be as low as 2.5 mils and as thick as 6 mils.

For electrostatic-spray applications, the particles are pumped as a fluid from a tank or hopper to a spray gun. At the nozzle of the spray gun, the particles are given a charge by an antenna connected to a power supply. The charged particles are then sprayed onto the electrically-grounded piece to be coated. The particles are carried to the workpiece by air pressure and adhere because of the electrostatic attraction between the charged particles and the grounded workpiece. The electrostatic attraction draws the charged particles to all surfaces of the workpiece, front and back, and into depressions and irregular contours.

The powder particles coat the work uniformly and adhere for a period of several hours. During this time, the work is placed in an oven operating at a temperature 10-20 degrees C above the melting point of the coating powder. The particles are melted, flow together, and form a thick, tough, tightly-adhering and uniform film. This forms a high dielectric barrier which will prevent moisture from penetrating the system.

3.2.5.2 Applications

Powdered coatings have been approved by NAVSEA to the following areas and components:

- vent screens
- deck electrical connection boxes
- deck light/fixtures
- mooring line reel
- security lights
- stokes litter
- topside telephone boxes
- visual landing aids
- weather-exposed meter and gage cases

3.2.5.3 Maintenance and Repair

DO NOT CHIP OR WIRE BRUSHSM

Powder-coated equipment must be handled carefully in order to avoid chipping or stripping the coating from the substrate. Powder coatings are less resilient than wire-sprayed coatings but does not require painting if the coating remains intact. Periodic washing with a mild soap and water will restore the surface to their original condition. Should the coating be damaged, however, the area should be repaired immediately in order to prevent corrosion of the exposed metal.

The repair procedure for powder-coated items consists of the following steps:

- The surface shall be lightly roughened with #100 grit sandpaper to provide a good bonding surface for the paint system.
- The edges of the area shall be "feathered" as shown in Figure 3-2 with #100 grit sandpaper.
- The area shall be cleaned with denatured alcohol to remove moisture, oil and dust.
- The surface shall be recoated following the appropriate paint system procedures provided in NSTM 631.

3.2.6 System Five: Non-Skid Deck Coating (Navy approved)

3.2.6.1 General

Non-skid deck coating is a 2-part coating material that is fire-resistant, impact-resistant and wear-resistant used to protect personnel, air crafts and vehicles from slipping under dry, oily or wet conditions. The system consists of primer coat, Formula 150 (MIL-P-24441), which improves the adhesion of the coating and a topcoat of the non-skid coating. The non-skid coating consists of aluminum or aluminum-oxide aggregate suspended in an epoxy resin and hardener. Non-skid coating shall conform to MIL-D-23003A(SH).

3.2.6.2 Applications

Locations to be coated with non-skid deck covering include:

flight and hangar decks
walkways

3.2.6.3 Maintenance and Repair

For repair of areas requiring non-skid deck coating, the following guidelines shall be followed:

- Determine whether the component has been WSA coated or not.
- Mechanically clean the damaged area .
 - .. If the area has been coated with WSA, lightly roughen the surface with a stainless steel wire brush.
 - .. If the area has not been coated with WSA, clean the surface to near-white metal with a wheel abrader or needle gun.
- Feather the edges of the area as shown in Figure 3-2 with a stainless-steel-wire brush.
- Clean the area with an approved solvent to remove all moisture, oil and dust.
- Apply a sealer coat of Formula 150 Epoxy Polyamide at a thickness of 2-4 mils.
- Apply a barrier coat of Formula 151 at a thickness of 2-4 mils.
- Apply the non-skid coating within 24 hours at a thickness based on 35 sq.ft./gal. of non-skid.

3.2.7 System Six: Ceramic Coatings (MIL-C-81751)

3.2.7.1 General

In this system, ceramic coatings provide corrosion and oxidation protection to carbon steel substrates such as nuts, bolts, fittings, etc. System Six is an inorganic coating formula consisting of an aqueous (water) binder solution with aluminum powder added as filler. The particle size is about 5 to 10 microns. The system contains phosphates which have been added to improve adhesion to the metal being coated. This coating is normally applied to fasteners at a 0.75- to 1.0-mil thickness. This system offers significant improvement over galvanized or cadmium-coated steel items.

3.2.7.2 Applications

All mild steel fasteners shall be ceramically coated.

3.2.7.3 Maintenance and Repair

Fasteners with ceramic coatings should be installed and reinstalled with anti-seize compound (See Section 3.2.9) in order to protect the applied coatings. The expected life of the coatings is approximately three years, and the repair of the coating is impractical for ship's force. Damaged coatings require replacement of the component which must be of identical composition to the damaged item.

3.2.8 System Seven: Water-Displacing, Clear, Corrosion-Preventive Compound

3.2.8.1 General

This system is a dry, clear, water-displacing, corrosion-preventive compound. System Seven will not prevent corrosion beyond a few weeks, but it is used where servicing, such as plugging/unplugging connections, is frequent. The compound may be applied from gas pressurized containers, by brushing or spraying. This material will displace light salt water moisture leaving a clear, corrosion-preventive film.

3.2.8.2 Applications

System Seven is intended for use on metal areas which are unpainted, or where the paint has cracked or been damaged, such as around multi-pin electrical connectors, joints, seams and access panels. It is not intended for use on moving parts where a lubricated surface is required. It is primarily intended for in-service use.

3.2.8.3 Application Procedures

The proper procedures for applying water-displacing compound are as follows:

- Wipe off dirt and excess moisture from the surface to be protected prior to applying the corrosion-preventive compound.
- Apply a thin uniform coat of corrosion-preventive compound directly on the area to be protected.
- Allow one-half hour drying time.
- Apply a second uniform coat of compound.
- Application by wiping is not recommended. The compound must be reapplied when the surface is cleaned with a solvent or when the coating is damaged by abrasion.
- The compound may be removed by using JP-5, DFM or isopropyl alcohol.

3.2.9 System Eight: Anti-Seize Thread Compound (MIL-T-22361)

3.2.9.1 General

This system is a zinc dust-petrolatum anti-seize thread compound. The compound is intended to prevent seizing during the assembly or disassembly of threaded or unthreaded components made from aluminum alloys that are engaged with components made from similar or dissimilar metals. The compound also acts to provide corrosion protection for the metal surfaces.

3.2.9.2 Applications

Anti-seize compound shall be used upon installation or reinstallation of all metallic fasteners.

3.2.9.3 Application Procedures

A small amount of compound shall be squeezed onto the hand and finger applied liberally to all threads of the fastener.

3.2.10 System Nine: Improved Fasteners

3.2.10.1 General

The term "fasteners" covers devices such as bolts, nuts, studs and washers that are used to attach metal pieces and metal fittings together. Fasteners used in topside applications are subject to corrosion by direct attack, pitting, stress corrosion and galvanic action. The initial selection of fastening techniques and fastener material does not always optimize corrosion resistance, but in many cases is decided on the basis of availability, commonality, or stress requirements.

3.2.10.2 Applications

In every application, it is essential that all components of a fastening system be compatible. For example, the use of a steel washer with a stainless steel or nickel/copper bolt and nut is a commonly-observed incompatibility. The most common fastening applications in exterior structural stress are steel to steel, steel to aluminum alloys, and aluminum alloys to aluminum alloys. For steel-to-steel application where high strength is required, low-alloy-steel fasteners (such as grade 5 or 8 of MIL-S-001222G) coated with a ceramic coating shall be used.

3.2.10.3 Maintenance and Repair

In instances where ceramically-coated or SS 316 Fastener assemblies have been furnished, the fasteners shall be kept clean or painted. Anti-seize compound shall be applied upon installation or reinstallation of the fasteners. Should damage occur, replacements should be installed identical to those originally supplied.

The CRES 316 alloy is 12-percent nickel, 18-percent chromium, and 3-percent molybdenum. This alloy performs best in a marine environment and shall be used. Nickel-copper alloy has various compositions, principally nickel with 30-percent copper and small amounts of aluminum, titanium, iron or silicon. All have good to excellent corrosion resistance characteristics.

3.2.11 System Ten: Sealing and Coating Compound

3.2.11.1 General

This system is a sealing and coating compound. The polysulfide sealant has corrosion-inhibitive chromates added to help protect the metal against any moisture which may ultimately penetrate the barrier. It is a two-part system which cures at room temperature to form a resilient (rubber-like) coating that adheres well to steel, aluminum and other metals.

3.2.11.2 Applications

This polysulfide sealant shall be used to provide corrosion protection on fasteners and other small similar crevices.

3.2.11.3 Application Procedures

The sealant is applied in accordance with the manufacturer's specifications and NSTM 631.

3.2.12 System Eleven: Polysulfide Sealant

3.2.12.1 General

This system is a corrosion-inhibitive sealing compound. The polysulfide sealant has soluble chromates to help protect the metal against any moisture which may ultimately penetrate the barrier. The sealant is intended for use only as a sealing compound at faying surfaces where metals are joined or fastened tightly together. This is a two-part system that will only cure in a joint in the absence of air. The curing process forms a resilient seal and will adhere well to steel, aluminum and other metals.

3.2.12.2 Applications

Polysulfide sealant shall be applied at all faying surfaces, i.e., foundations.

3.2.12.3 Application Procedures

The sealant is applied in accordance with the manufacturer's specifications and NSTM 631.

3.2.13 System Twelve: Protection of Electrical Connectors

3.2.13.1 General

These devices are for protecting topside electrical connections and are especially useful for multi-pin or cannon-plug connections on electronic equipment. The systems are (in order of preference) heat-shrinkable tubing, sealant with vinyl tape, and vinyl tape with putty. Variations and combinations of each may be used to suit the particular situation. Each is easy to remove with either a knife or moderate heat and a knife.

3.2.13.2 Applications

Electrical connection protectors may be used at multi-pin or cannon-plug connectors in interior communications or radio handsets, fire-control devices and other electrical, radar or radio components.

3.2.13.3 Application Procedures

The correct procedures for using the devices are as follows:

- **Heat-Shrinkable Tubing** - Install the sleeve to cover the entire connector including the rotating cap. After completely tightening the connector, heat the sleeve to not more than 250°F using a cool torch or electrical heat gun. The sleeve will shrink to fit the connector, and, at the same time, an adhesive in the sleeve will soften, thereby providing additional corrosion protection.

If the connector must be disconnected frequently, as is done for radio and 1C handsets, do the above step for only the non-rotating parts. The cap should be treated with water-displacing, clear, corrosion-prevention compound at each reinstallation.

- **Sealant with Vinyl Tape** - This system consists of brushing on a fast-drying sealant over vinyl tape. The vinyl tape overlaps the connector approximately 3 inches and is sealed with two coats of the fast-drying sealant. If the cable is unprotected, double wrap the connection (first with a silicone rubber tape and secondly with the standard vinyl insulation tape).
- **Vinyl Tape and Putty** - This system uses a special insulation compound which is further covered by tape. Tightly wrap the connection using a suitable insulation putty or caulking compound (include at least 3 inches of cable). While wrapping, stretch the insulation tape to 1/2-inch thickness and apply at least four overlapping layers. If the caulking compound is used, allow it to harden before the next step.

For either the tape or caulk, cover with three layers of tightly drawn vinyl electric tape. As for the shrinkable tubing, modify as needed to suit the permanency of the connection.

3.2.14 System Thirteen: Dielectric Barrier

3.2.14.1 General

Dielectric barriers are used to provide electrical insulation between two dissimilar metals. This barrier prevents galvanic corrosion by breaking the electrical path and will also provide abrasion protection. Typical barrier materials are nylon, neoprene and acrylonitrile butadienestyrene.

3.2.14.2 Applications

Dielectric barriers shall be used at all dissimilar-metal junctions, such as label plates, fastener locations, pedestal-stand foundations, etc.

3.2.14.3 Application Procedures

Dielectric barriers shall be installed as follows:

- For fastener assemblies, dielectric barriers (nylon washers) shall be placed at each dissimilar metal contact.
- For label plates, foundations, etc., gasketing material shall be sized such that the contact surface is completely protected.

3.2.15 System Fourteen: Vapor Phase Inhibitor (MIL-I-22110)

3.2.15.1 General

System Fourteen, Vapor Phase Inhibitor (VPI), is intended as a preservation for ferrous, aluminum, aluminum-base alloys and components in closed or low-air-flow spaces. When VPI material is exposed, it sublimates into a vapor which penetrates through the spaces to all exposed metallic surfaces. On contact with the surface, the vapors condense into a highly-protective, invisible molecular film which provides corrosion resistance.

3.2.15.2 Applications

As a rule, the application of vapor phase inhibitors must be in confined areas with limited air flow such as tool boxes, lockers and small containers.

3.2.15.3 Application Procedures

Vapor-Phase Inhibitor shall be applied in accordance with manufacturer's specifications.

3.2.16 System Fifteen: Strippable Coating

3.2.16.1 General

In this system, a synthetic rubber compound is used as a strippable coating for fasteners and similar components for corrosion protection when these components are exposed to marine environments. It is a two-part system which cures at room temperatures to form a resilient coating which adheres well to steel, aluminum and other metals.

3.2.16.2 Applications

Strippable coatings shall be used to protect fasteners on similar components subject to exposure upon disassembly that will be reinstalled at a later time.

3.2.16.3 Application Procedures

This system is packaged in a kit and should be applied following these general guidelines:

- The base compound should be thoroughly mixed to obtain a uniform consistency before adding the accelerator. The accelerator should also be mixed thoroughly in its container.
- The accelerator is stirred into the base compound and thoroughly mixed. It is important to scrape the sides and bottom of the container and the mixing paddle to be sure blending is uniform.

- Surface to be protected must be cleaned with solvents just before applying the sealant to remove dirt, grease and other contamination.
- Apply polysulfide compound using a spatula, brush or similar device as appropriate over clean painted surfaces. Thickness shall be minimum to ensure complete coverage.

SECTION 4

ITEMS PRESERVED DURING 5 FEBRUARY 1985 to 5 APRIL 1985 SRA

4.1 ITEMS PRESERVED

Table 4-1 lists all the items preserved during the 5 February 1985 to 5 April 1985 SRA. They are indexed alphabetically by item name followed by location (deck, frame and side of ship) and the corrosion-control system(s) that were provided.

The preserved items are also shown on plot plans of the weather decks to aid in identifying and locating the specific items (Figures 4-1 through 4-9).

4.2 SUMMARY of PRESERVATION PACKAGE

The success of this corrosion control program is very promising provided proper care and repair procedures are followed. Any items that were scratched or chipped during reinstallation should be repaired in a timely manner in order to maintain their corrosion resistance. The use of proper fasteners and gasketing materials is equally crucial to the life of these items.

Additional items that were not preserved due to the CC Shop capacity limitations and ship's ability to schedule and deliver work items to the CC Shop should remain on the ship's CSMP so that they can be serviced in a future availability. It is essential that an AWR accompany each item that enters the shop in order to develop the planning and estimating for future production and expansion.

**TABLE 4-1 USS COPELAND ITEMS PRESERVED DURING 05 FEBRUARY 1985
TO 05 APRIL 1985 SRA**

ITEM DESCRIPTION	LOCATION	PLOT PLAN PAGE	CORROSION-CONTROL SYSTEMS DELIVERED												REMARKS
			NAVSEA CC SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	ANALYTICAL SYSTEM	
Light, Overhead Flood	02-100-4	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-250-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-250-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-3	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-3	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-3	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-4	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Overhead Flood	02-330-4	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Signal Search w/Yoke	02-125-1	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Signal Search w/Yoke	02-125-2	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Signal Search w/Yoke	02-175-1	4-12	X	X	X	X	X	X	X	X	X	X	X	X	
Light, Signal Search w/Yoke	02-175-2	4-12	X	X	X	X	X	X	X	X	X	X	X	X	
Phone Box	1-170-1	4-9	X	X	X	X	X	X	X	X	X	X	X	X	
Phone Box	1-170-2	4-9	X	X	X	X	X	X	X	X	X	X	X	X	
Phone Box	02-100-1	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Phone Box	02-100-2	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	1-200-1	4-9	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	1-200-2	4-9	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	1-410-2	4-10	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	02-120-1	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	02-125-1	4-11	X	X	X	X	X	X	X	X	X	X	X	X	
Pyro Locker	02-250-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	
Mount, Big Eyes	02-200-1	4-12	X	X	X	X	X	X	X	X	X	X	X	X	
Mount, Big Eyes	02-200-2	4-12	X	X	X	X	X	X	X	X	X	X	X	X	
Reel, Swimmers' Safety Line	1-90-1	4-7	X	X	X	X	X	X	X	X	X	X	X	X	
Reel, Swimmers' Safety Line	1-90-2	4-7	X	X	X	X	X	X	X	X	X	X	X	X	
Screen, Boat Davit	01-195-2	4-9	X	X	X	X	X	X	X	X	X	X	X	X	
Screen, Bullnose	1-2-0	4-6	X	X	X	X	X	X	X	X	X	X	X	X	
Screen, MWB Cable	01-185-2	4-12	X	X	X	X	X	X	X	X	X	X	X	X	
3 Total															

TABLE 4-1 USS COPELAND ITEMS PRESERVED DURING 05 FEBRUARY 1985
TO 05 APRIL 1985 SRA

ITEM DESCRIPTION	LOCATION	PLOT PLAN PAGE	CORROSION-CONTROL SYSTEMS DELIVERED																REMARKS
			NAVSEA CC SYSTEM	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Speaker, 1MC	1-W-1	4-8																	
Speaker, 1MC	1-110-1	4-9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	1-110-2	4-9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	1-180-1	4-9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	1-180-2	4-9	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	02-130-0	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	02-290-0	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	02-330-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	02-330-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 1MC	02-330-4	4-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Speaker, 6MC	02-180-0	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Support, Bridgwing Chair	02-102-2	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Support, MWB Boat	01-185-2	4-12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Support, MWB Boat	01-200-2	4-12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Swivel, FAS Bulkhead	02-130-1	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Swivel, FAS Bulkhead	02-130-2	4-11	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Swivel, FAS Bulkhead	02-310-1	4-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Swivel, FAS Bulkhead	02-310-2	4-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Tripod, 50 Cal Mg	1-176-1	4-8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Tripod, 50 Cal Mg	1-170-2	4-8	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Tripod, 50 Cal Mg	02-105-1	4-14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Tripod, 50 Cal Mg	02-105-2	4-14	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Wrench, Anchor Stopper	1-35-1	4-2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

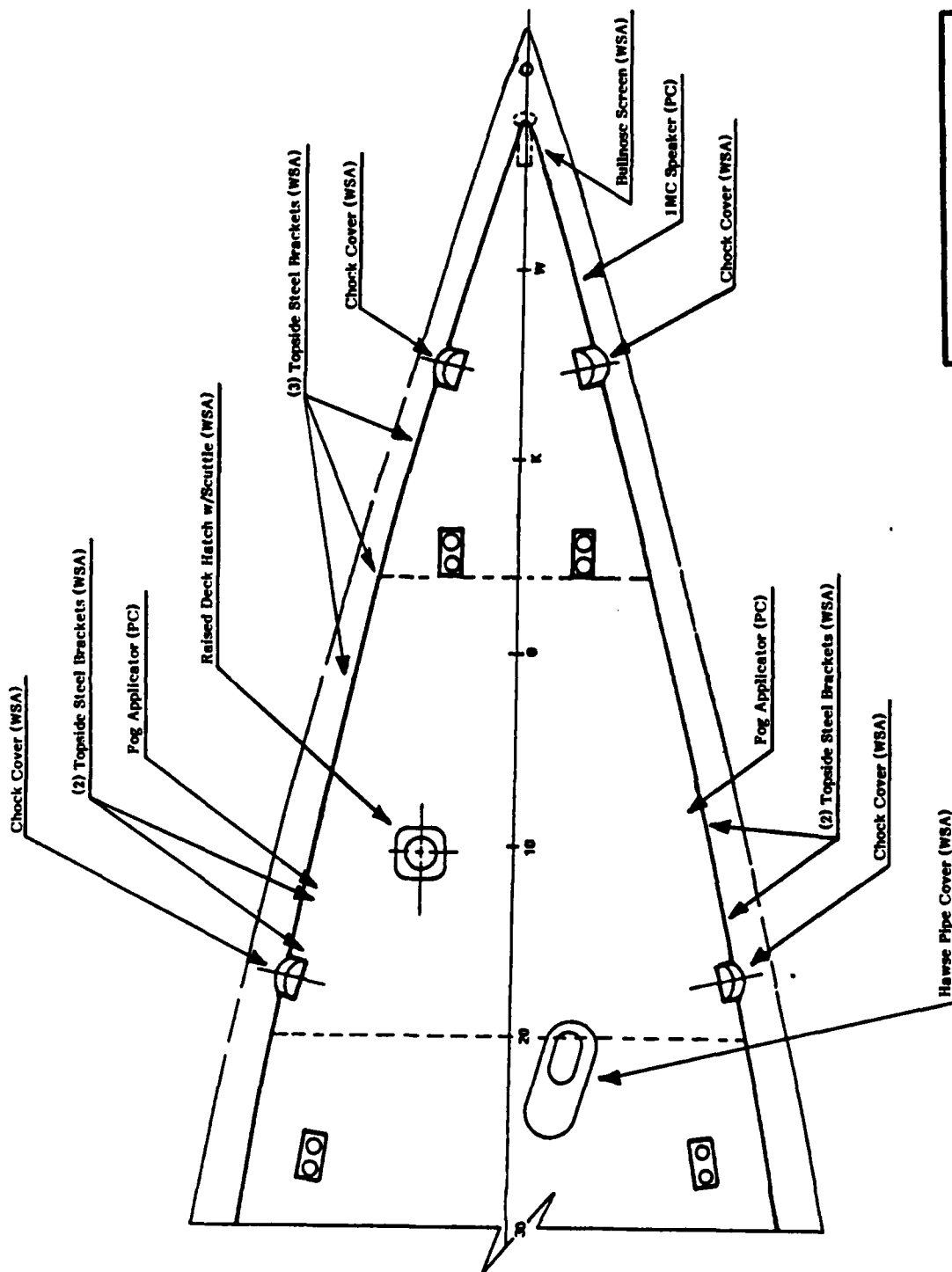


FIGURE 4-1
USS COPELAND (FFG-25)
 Forcastle (Frame 1-30)
 Rev. 0/30 April 1985

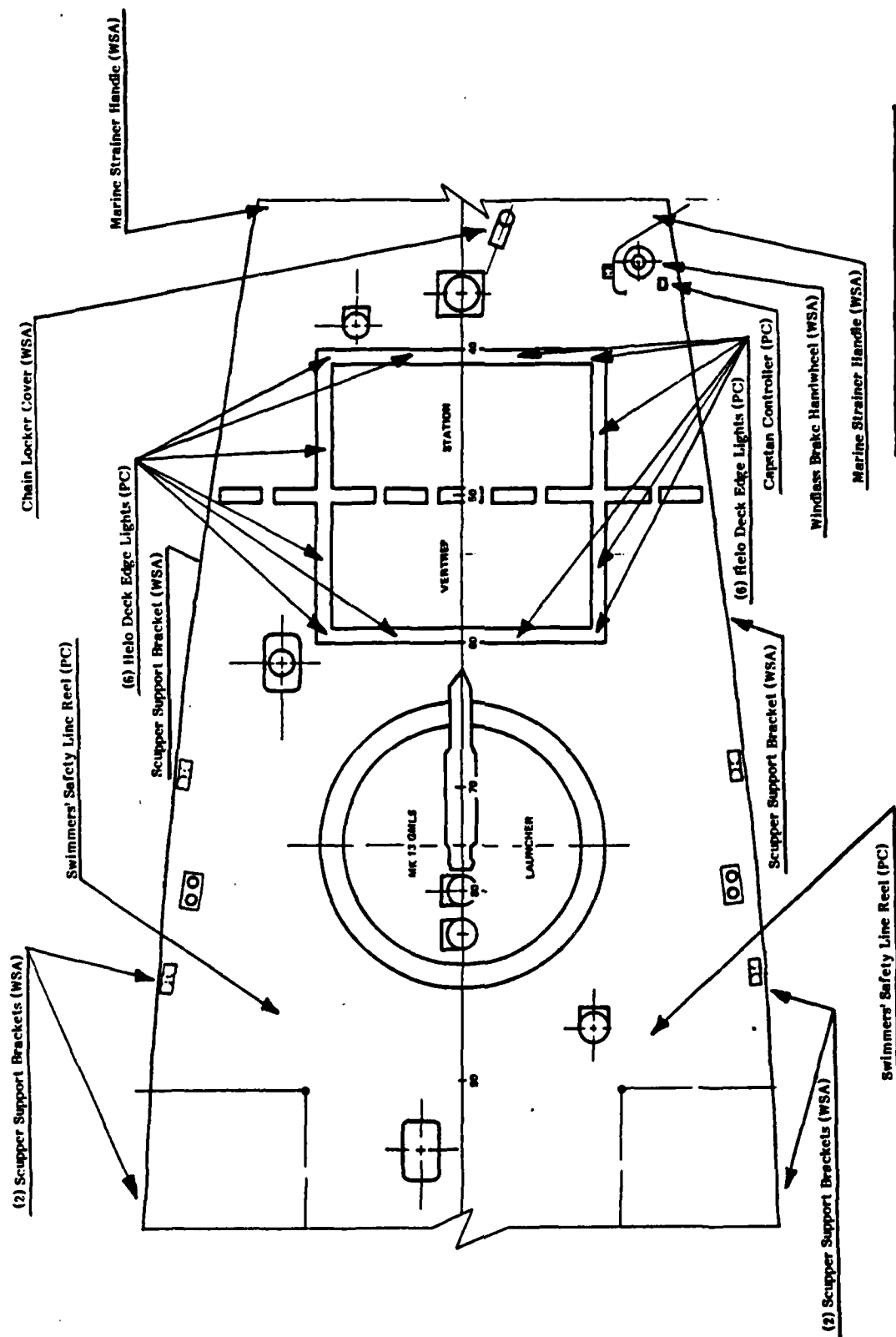


FIGURE 4-2
USS COPELAND (FFG-25)
 Forcastle (Frame 30-100)
 Rev. 0/30 April 1985

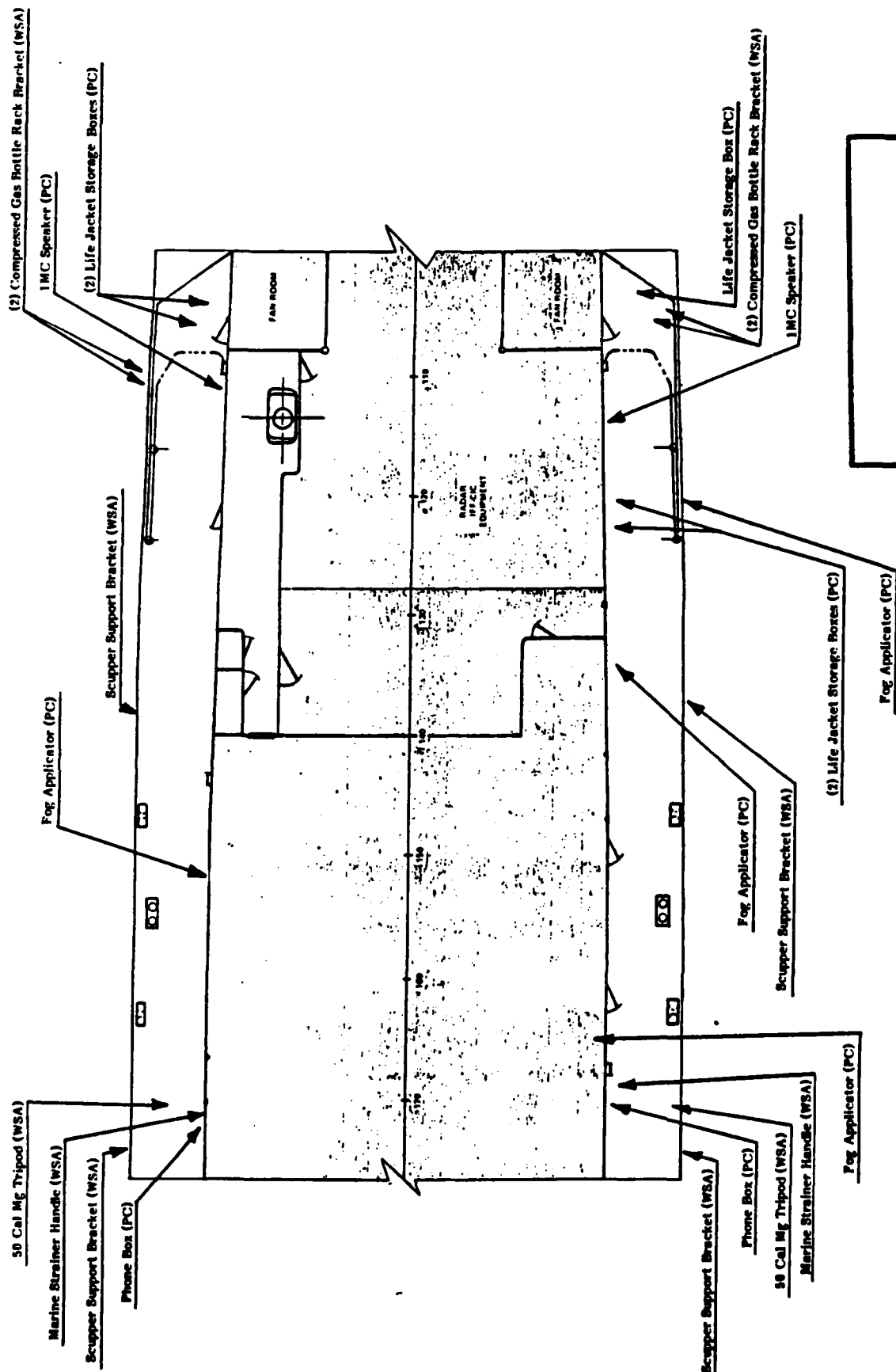


FIGURE 4-3
USS COPELAND (FFG-25)
Midships (Frame 100-176)
Rev. 0/30 April 1985

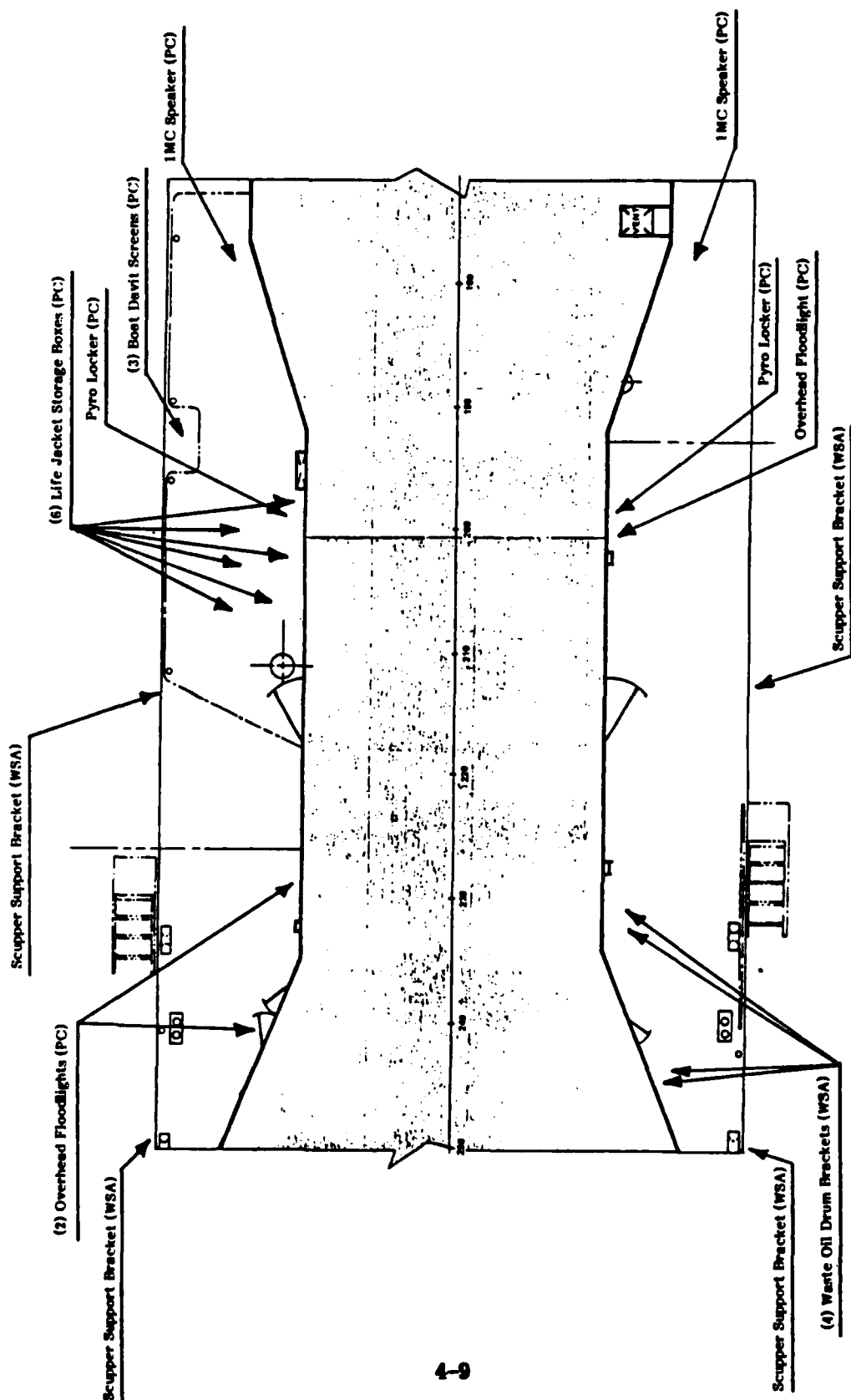


FIGURE 4-4
USS COPELAND (FFG-25)
 Midships (Frame 176-252)
 Rev. 0/30 April 1985

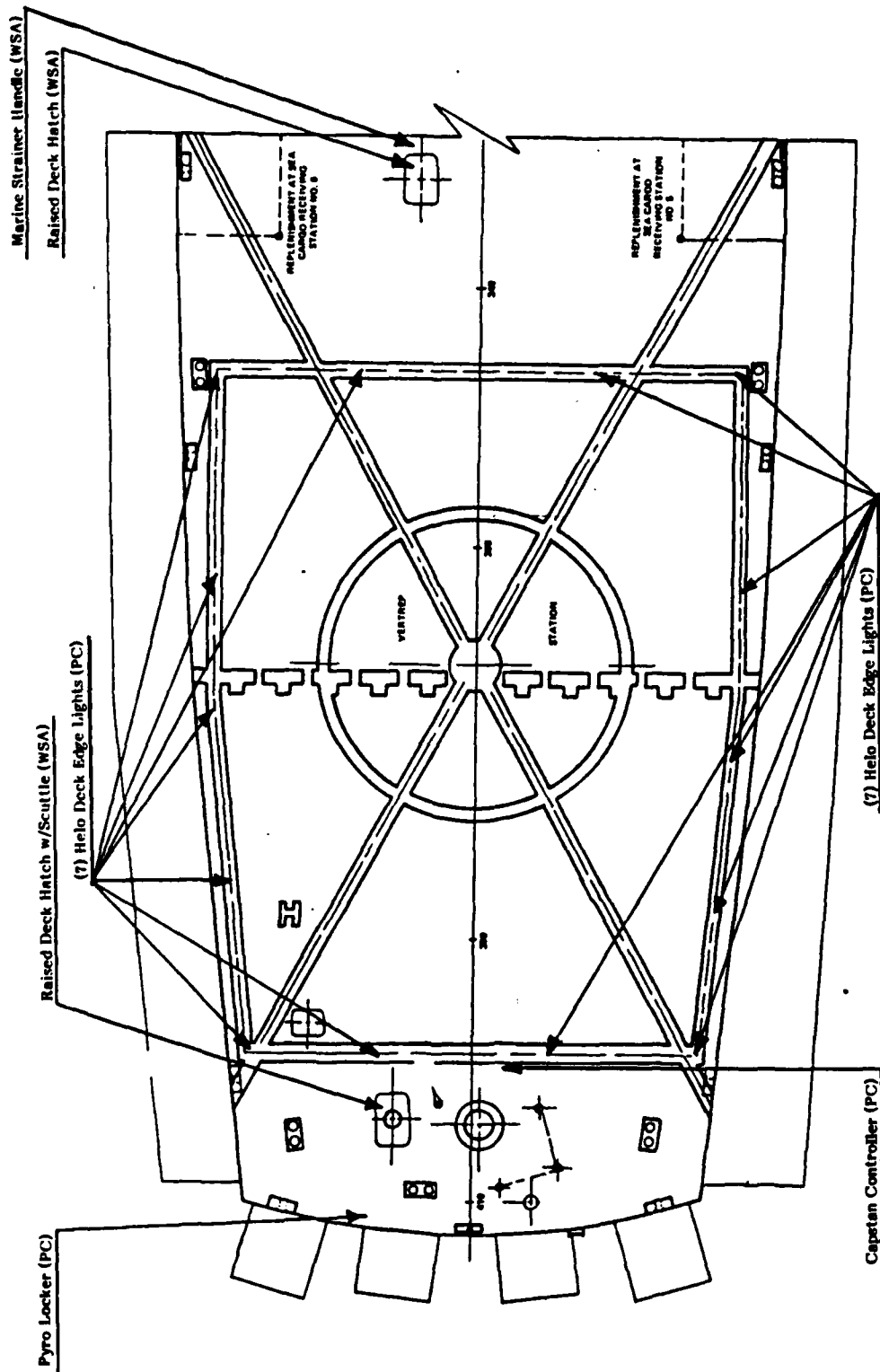


FIGURE 4-5
USS COPELAND (FFG-25)
 Fantail
 Rev. 0/30 April 1985

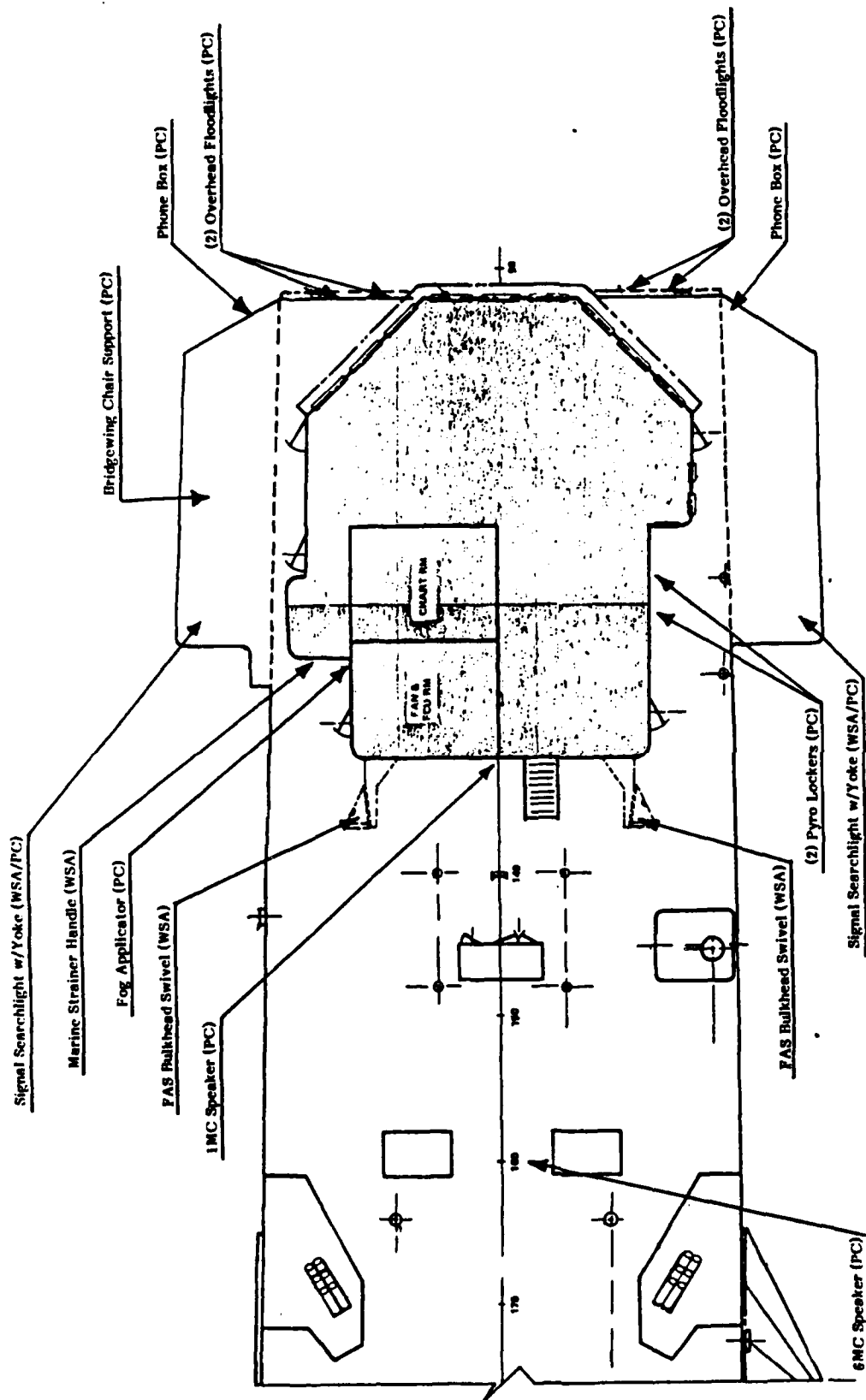


FIGURE 4-6
USS COPELAND (FFG-25)
 02 Level Forward
 Rev. 0/30 April 1985

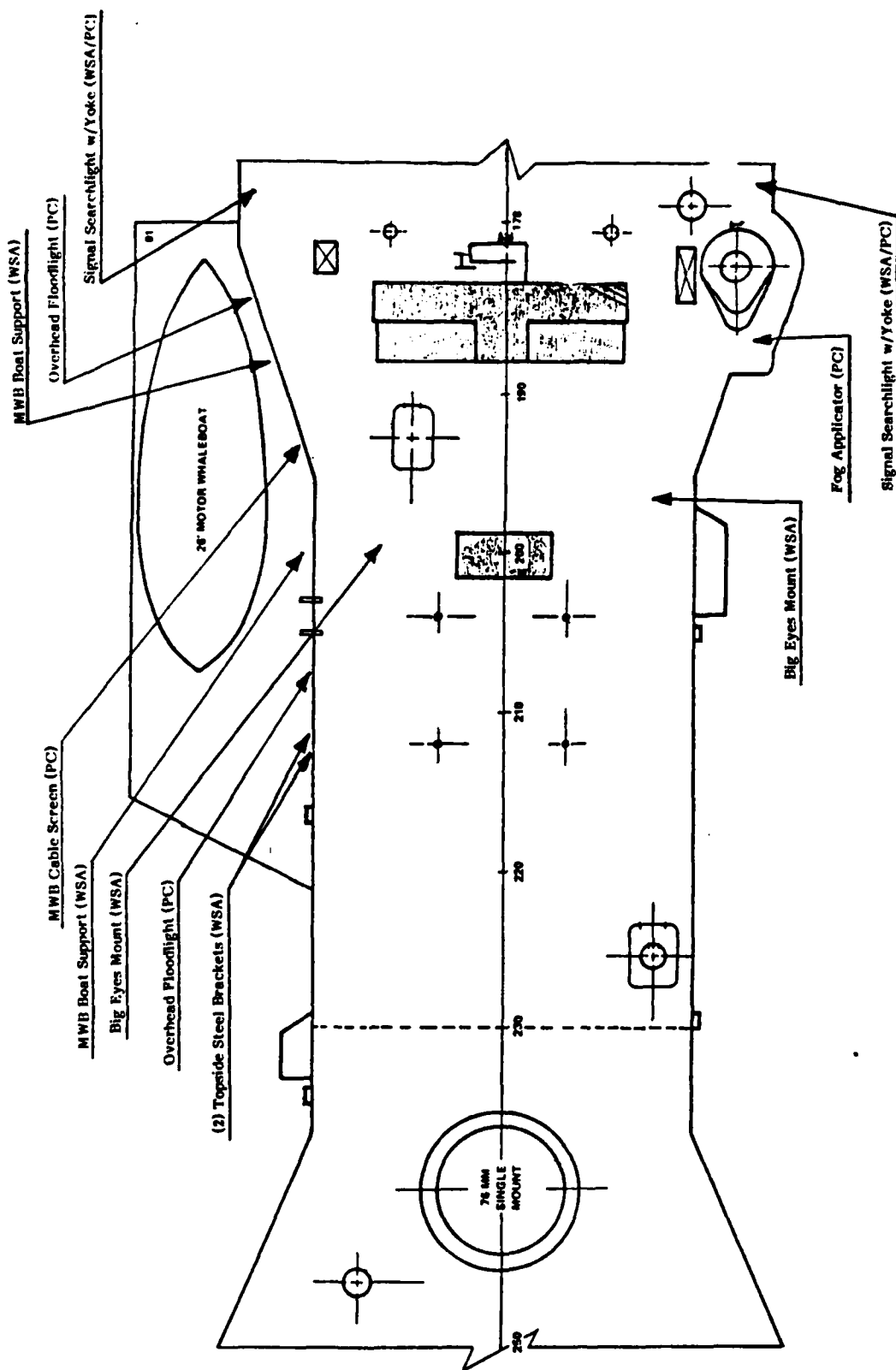


FIGURE 4-7
USS COPELAND (FFG-25)
 01-02 Level Midships
 Rev. 0/30 April 1985

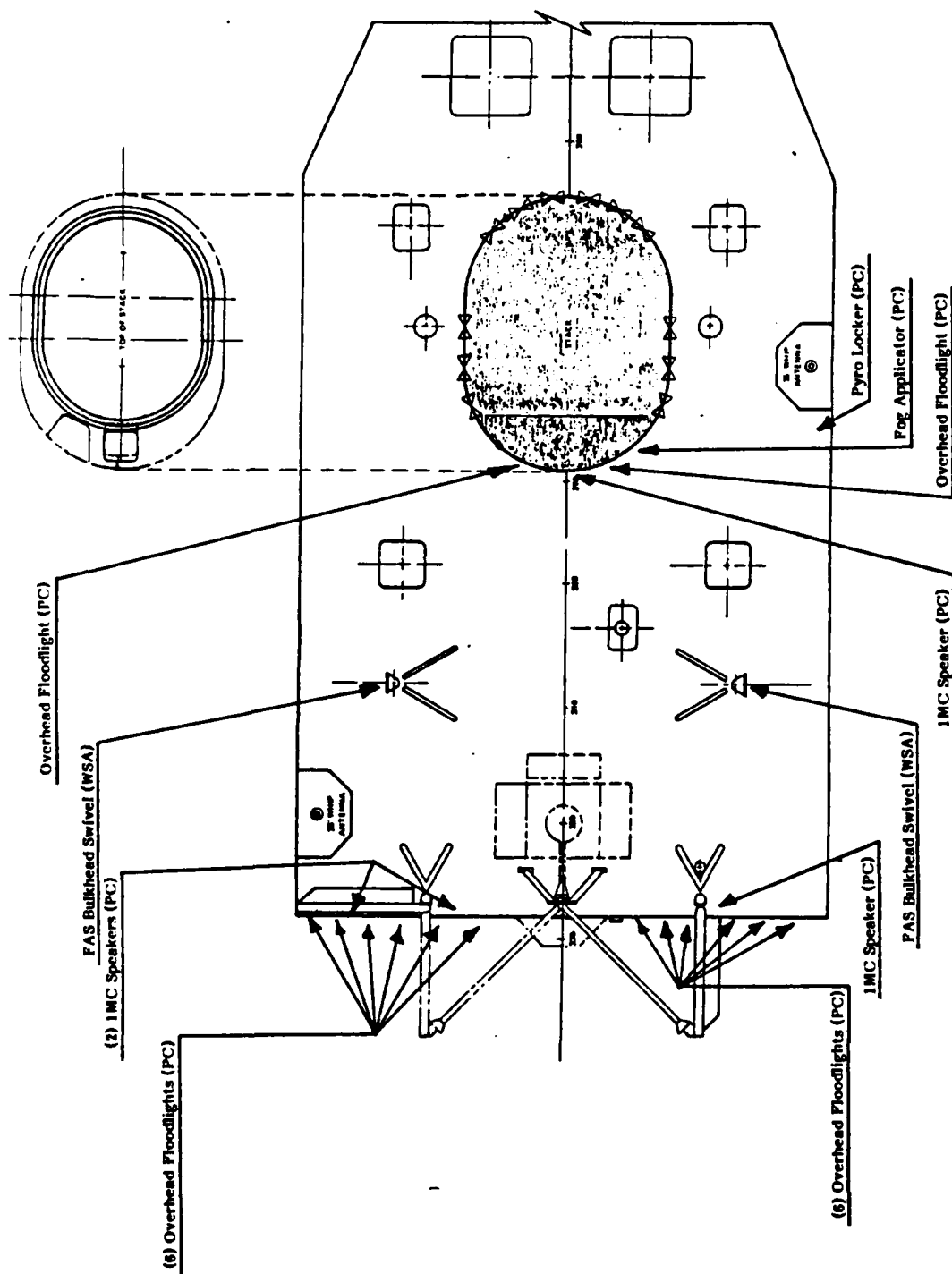


FIGURE 4-8
USS COPELAND (FFG-25)
02 Level Aft
Rev. 0/30 April 1985

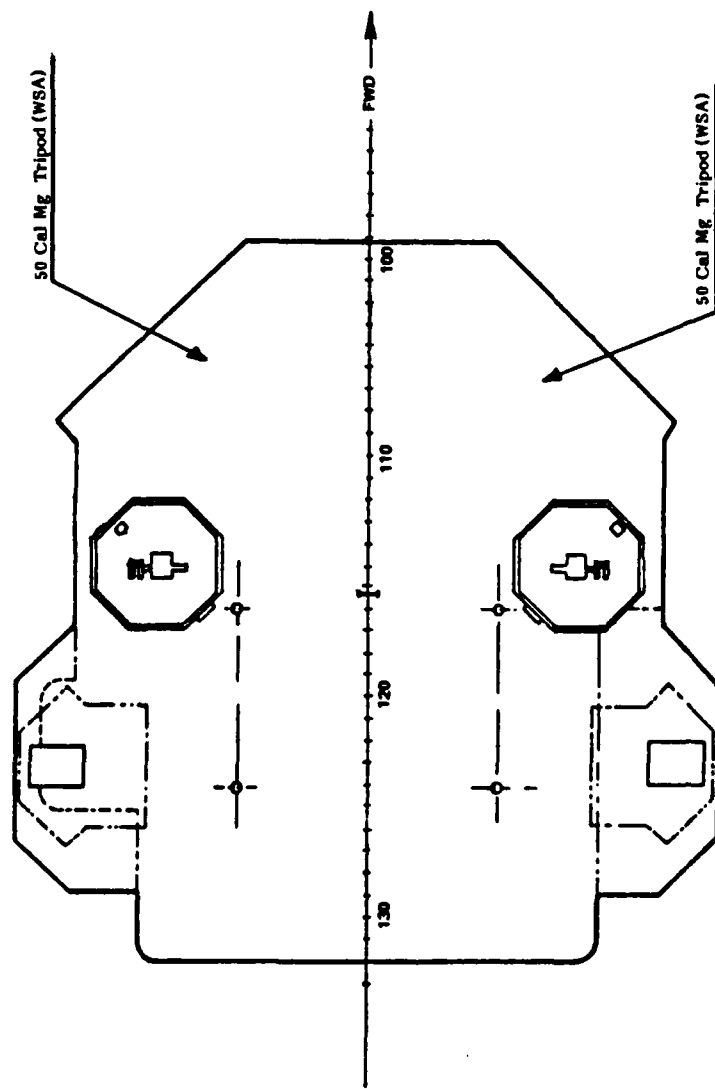


FIGURE 4-9
USS COPELAND (FFG-25)
03 Level
Rev. 0/30 April 1985

APPENDIX A

CORROSION CONTROL - "T" DIVISION BRIEF

TITLE: Corrosion Control, Introduction to the USS _____ Corrosion Control Program

OBJECTIVE(s):

1. To acquaint you with the ship's corrosion-control program and to stress the importance of corrosion control in the sea environment.
2. To acquaint you with the ship's Corrosion Control Coordinator and explain your responsibilities and those of the Corrosion Control Coordinator in the areas of corrosion control.

MATERIALS:

1. Cite reference manual Corrosion Control for _____ Class.
2. Show samples of flame-sprayed or powder-coated materials (walk through areas and point them out).

INTRODUCTION:

I am _____, the USS _____'s Corrosion Control Coordinator.

Introduce topic: Corrosion Control aboard USS _____.

PRESENTATION:

1. Describe Corrosion.
2. Mention trouble-prone areas.
3. Describe corrosion control systems.
 - Show manual and state purpose.
4. Describe WSA and powder processes.
 - Mention where used aboard.

5. Mention Corrosion Control item list.
 - Purpose
 - .. Don't chip or clean with chemicals.
 - Describe damages to powder-coated surfaces from using solvents - rubbery/disintegration.
6. Do's and Don'ts.
 - Again - don't chip, wirebrush or needle gun WSA or powder-coated items.
 - Don't paint powder-coated items.
 - Do check with me if you are not sure.
 - Do clean with water and mild soap.
 - Don't use improper/unapproved fasteners with WSA and powder coated items.

APPLICATION:

1. Corrosion control is everyone's job.
2. The corrosion-control program will make your job easier if followed correctly.
3. Give handouts and answer questions.

SUMMARY:

1. Ask questions to cover key points of lecture/brief.
2. Dismiss group.

APPENDIX B

CORROSION CONTROL - "I" DIVISION HANDOUT

Welcome aboard the USS _____. I am Chief/Mr. _____, the ship's Corrosion Control Coordinator. Corrosion control is a never ending battle aboard ships to prevent the sea environment from eating up our ship and its equipment. What exactly is corrosion? Corrosion is the process whereby metals break down into their natural state and combine with oxygen in the air we breathe to form metallic oxides. The two most common oxides you'll see aboard ship are rust (ferrous oxides) formed from the disintegration of irons and steels and aluminum oxide formed from the disintegration of aluminum.

Corrosion occurs in much the same way as a car battery operates. It can sit for years on a shelf, good as new, until battery acid is added. Then it produces the electricity we need, but in the process, it eventually destroys itself by oxidation of its metallic elements. Aboard ship, moisture serves as the battery acid.

As you can see, there is an abundant supply of moisture aboard the USS _____. Corrosion is waiting patiently to get a foothold wherever it can. In an effort to control this problem, several methods or systems have been developed to control the corrosion of shipboard components. These systems are listed and discussed in detail in the Corrosion Control Manual for _____ Class ships. Several of these corrosion preventative systems are very expensive and require "off-ship" work by an I.M.A., Intermediate Maintenance Activity, such as S.I.M.A., or by a shipyard.

Two of the more common methods S.I.M.A. has used to treat our topside components are wire-sprayed aluminum (WSA) and powder coating (PC). In the WSA process, steel items are grit blasted down to bare metal; then, they are sprayed with melted aluminum and covered with five coats of paint (a sealer coat, two barrier coats and finally two topcoats of haze gray or other appropriate Navy topside paint). S.I.M.A. also "powder coats" many items. These are grit blasted also; then, they are heated and sprayed with a powdered resin that is electrically charged. This allows the powder coat to adhere to the smallest crack and crevices in the metal. The coated item is then heat treated in an oven, much like baked enamel on automobiles and motorcycles. Powder-coated items can be easily recognized. They are very smooth and almost slick to the touch. Vent screens and unrep lights are usually powder coated. Many watertight doors and deck fittings are protected by the wire-sprayed-aluminum process.

What is important for us to know is that these items should last from five to ten years in normal use. However, if the coating, the corrosion-control barrier, is broken by a chipping hammer, needle gun or other object, the "battery" is activated and corrosion will occur if the damage is not repaired. Most items protected by these methods need only be cleaned occasionally with fresh water or cosmetically topcoated.

Here are some general guidelines to follow:

- Don't chip any item unless you are absolutely sure it has not been wire sprayed or powder coated.
- Never paint any powder-coated item - sometimes they may need repair and then they will be coated but only by direction.
- If the coatings become damaged, follow the maintenance recommendations supplied by S.I.M.A. as soon as possible.

I have a listing of all items on board that have been treated for corrosion control. If you have any doubts, see me before you chip any paint. Mr./Chief _____ is the ship's alternate Corrosion Control Coordinator; if I am not available, please contact him. The Corrosion Control Program is designed to reduce your topside maintenance and increase the longevity of shipboard components. It will, if you do your part.

APPENDIX C

CORROSION CONTROL PRE-SRA POD NOTE

The ship is soon entering an SRA period, from _____ to _____. S.I.M.A.'s Corrosion Control Shop, Shop 06I, will be assisting us in our anti-corrosion efforts by providing wire-sprayed aluminum (WSA) and powder coatings (PC) for many shipboard items. These corrosion-control processes are designed to provide corrosion protection for five to ten years. All work performed by Shop 06I is on a "ship-to-shop" basis and SMAFs are required for individual work center job orders.

Now is the time to identify items for Corrosion Control. Submit work requests (SMAFs) and/or questions about the Corrosion Control Program to Chief/Mr. _____, the ship's Corrosion Control Coordinator, no later than _____.

APPENDIX D

CORROSION CONTROL POST-SRA POD NOTE

During our last SRA/RAV/in-port period, we had quite a bit of corrosion-control work done to topside components on the ship. Any of you who have topside equipment know the sea is a harsh environment. The moisture in the air is enough to accelerate corrosion (the rusting of steel and the powdering of aluminum) when these metals are left unprotected. Fortunately, most shipboard corrosion can be kept in check by you, the crew; but, in some cases, it seems difficult to almost impossible to keep ahead of the corrosion. The ship's Corrosion Control program is attempting to ease the burden of topside maintenance in these troublesome areas by providing Wire-Sprayed Aluminum and Powder Coating for these items.

S.I.M.A. has provided the requested corrosion-control coatings, which should prevent corrosion for from five to ten years, if properly cared for. Most wire-sprayed-aluminum and powder-coated items only need washing with fresh water occasionally. Wire-sprayed items may be touched up by a cosmetic paint coat, but they must never be chipped. Powder-coated items must not be chipped or painted. These coatings provide a "corrosion control barrier" which must be repaired as soon as possible if damaged for any reason; otherwise, corrosion will set in.

Of equal importance in the ship's Corrosion Control program is the use of proper fasteners. You can have the best coating applied to a topside item and destroy its effectiveness by fastening it in place with nuts and bolts of the wrong metallic composition. When you are re-installing corrosion-control items, ensure the correct fasteners are used. If in doubt, check with Mr./Chief _____, the Corrosion Control Coordinator.

Here are some general guidelines to be observed with corrosion control items:

- Don't chip any item unless you are absolutely sure it has not been wire sprayed or powder coated.
- Never paint any powder-coated item.
- If damage should occur to a corrosion-controlled item, follow the maintenance recommendations supplied by S.I.M.A. as soon as possible.
- Exercise care when working with or around wire-sprayed and powder-coated items.
- Use mild soap and water to clean preserved items.

Following these simple guidelines will reduce topside-maintenance manhour requirements.

APPENDIX E

CORROSION CONTROL ROUTINE POD NOTE REMINDER

One of a maritime nation's constant enemies throughout time is still with us today. Many a mast has fallen and many a winch has frozen due to the effects of corrosion. The "sailors' curse" has caused many a busted knuckle on a rusted-up bolt or turnbuckle. We carry large quantities of paints and primers to fight that never ending battle with corrosion, the enemy that never sleeps.

Fortunately, for we modern day sailors, large inroads have been gained in the battle against corrosion and several systems have been developed to help Navy ships fight the adverse effects of corrosion. These corrosion-control systems have been developed and compiled for this class ship and are described in detail in the "Corrosion Control Manual for _____ Class" ships. Presently, the ship has several topside components which have been protected by the wire-sprayed-aluminum or powder-coating process. These coatings should prevent corrosion from five to ten years, provided no damage is done to the surfaces. Great labor savings and equipment reliability can be realized by the use of these coatings.

If a chipping hammer or like instrument is used on these items, the corrosion-control barrier is broken, and the item will corrode if the damage is not repaired. Powder-coated items are also susceptible to damage from chemicals/solvents. Mild soap and water is all that should be required to maintain these preserved items. A ten-percent solution of tri-sodium phosphate is the only cleaning solution recommended for use on powder coatings. The ships' Corrosion Control Coordinator, Mr./Chief _____, has a listing of all items on board that have been treated for corrosion control.

Here are some precautions to be observed with maintenance of corrosion-controlled items:

- Never paint or use solvents on powder-coated items.
- Don't chip any item unless you are absolutely sure it has not been wire sprayed or powder coated.
- Exercise care when working with or around wire-sprayed and powder-coated items.
- Use mild soap and water for cleaning purposes (a 10% tri-sodium phosphate solution may be used to remove grease from powder-coated items).
- If damage should occur to a corrosion-control-treated item, follow the maintenance recommendations supplied by S.I.M.A. as soon as possible.

APPENDIX F
DISTRIBUTION

	<u>NUMBER of COPIES</u>
Commanding Officer, U.S.S. COPELAND (FFG-25)	1
Corrosion Control Coordinator, U.S.S. COPELAND (FFG-25)	1
SIMA(SD) Corrosion Control Pilot Shop 06I	1

No.: 7100-19-84
Effective: _____
Cancels: Original Issue

D R A F T



PROCESS INSTRUCTION

Shore Intermediate Maintenance Activity
San Diego, Naval Station, Box 106
San Diego, California 92136

TITLE: POWDER COATINGS, ELECTROSTATICALLY APPLIED:
NAVSEA CORROSION-CONTROL (CC) SYSTEM 4

SECTION:	I	EQUIPMENT	IV	QUALITY CONTROL
	II	MATERIAL	V	METHOD
	III	SAFETY	VI	FEEDBACK

ORIGINATOR: 8100 and SHOP 06I

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION: ORIGINAL ISSUE

APPROVALS:

DATE

ORIGINATOR:	<u>(7100/8100/Shop 06I)</u>
PLANNING:	<u>(2000)</u>
REPAIR OFFICER:	<u>(3090)</u>
PRODUCTION:	<u>(3000)</u>
SAFETY:	<u>(0140)</u>
QUALITY ASSURANCE:	<u>(5000)</u>
ENGINEERING:	<u>(7000)</u>

REVIEW: ANNUALLY

LEAD SHOP: PILOT CORROSION-CONTROL SHOP
SHOP 06I

ASSIST SHOPS: 72A 72C
11A 26A
17A

REFERENCES

- A. NAVSEA Corrosion-Control Manual for AO-177, DD-963, FF-1052, FFG-7, CG-16, LHA-1, LST-1179, LPH-2 and LPD-4 Class.
- B. NORDSON, Manufacturer of Electrostatic Powder Coating Equipment, Finishing Equipment Division, D-1 and D-1A Powder Spray Systems.
- C. RANDSBURG-GEMA Electrostatic Powder Coating System, Type 701 and 702.
- D. BAYCO Industries of Ca., Custom Curing Ovens.
- E. American Society for Testing and Materials (ASTM) D-2794, Impact Resistance.
- F. ASTM B-117, Saltspray Resistance Test.
- G. ASTM D-2247-68, Humidity Resistance.
- H. ASTM D-822, Weatherability
- I. ASTM A775/A775M-84, Epoxy-Coated Reinforcing Steel Bars.
- J. ASTM D-3363, Pencil Hardness.
- K. ASTM D-3359, Cross Hatch Adhesion.
- L. NAVSEA S9086-VD-STM-000/CH-631, Preservation of Ships in Service (Surface Preparation and Painting), 15 Apr 81.
- M. Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) Rev. 11 March 81.
- N. National Fire Protection Association (NFPA) Standard 33, Spray Application Using Flammable and Combustible Materials, 1985.
- O. NFPA Standard 70, National Electrical Code, 1984.
- P. NAVSEA Ltr 9630 Ser 05M1.14/374 dated 12 Sep 85.

STANDARD DISTRIBUTION: (1 copy unless noted otherwise)

Code:	0140	3300	Shop:	11A	67A	
	2000	3600		17A	38D	67E
	2160	3700		67H		
	2161 (3)	3800		51A		
	2162 (3)	5000		51B		
	2163 (3)	7000			72E	
	3090	7100				
	3100	7200		06I (12)		
	3200	7300				

Shore Intermediate		NAVSHIPYD CHASN	(Code 380)	(1)
Maintenance Activity		NAVSHIPYD LBEACH	(Code 380)	(1)
		NAVSHIPYD MARE	(Code 380)	(1)
Pearl Harbor	(2)	NAVSHIPYD PEARL	(Code 380)	(1)
Alameda	(2)	NAVSHIPYD PHILA	(Code 380)	(1)
Long Beach	(2)	NAVSHIPYD NORFOLK	(Code 380)	(1)
Charleston	(2)	NAVSHIPYD PUGET	(Code 380)	(1)
NAVAIRLANT	(2)	NAVSHIPYD Ports	(Code 380)	(1)
Little Creek	(2)	SUPSHIP Charleston		(1)
Mayport	(2)	NAVSES PHILA	(Code 053B)	(1)
Norfolk	(2)	DTNSRDC/ANNA	(Code 2803M)	(1)
NAVSURFLANT Readiness				
Support Group	(2)			

ADDITIONAL DISTRIBUTION: COMNAVSEASYS COM (SEA 05M1, 91AD121, 0704, 075) (1 copy each)

SCOPE: The scope of this process instruction covers the required equipment, method or industrial process, safety and quality control required for applying the NAVSEA Corrosion-Control (CC) Coating, System 4 (Powder Coatings, Electrostatically Applied) (Ref. A) to ferrous and aluminum-alloy substrates in accordance with the manufacturer's recommendations.

COORDINATION:

VALIDATION:

SECTION I

EQUIPMENT

1.1 GENERAL

The equipments specified in this Process Instruction are typical for application of powder coating systems electrostatically applied in an industrial activity. The equipments consists of an electrostatic spray gun, power supply, resin hoppers, (Refs. B and C); dry filter spray booth, resin recovery system (optional), conveyor system (optional) curing oven, (Ref. D); grit-blast booth, grit-blast nozzle and hoses, pressure pots, grit-recovery system (optional), air-purification system, air-dryer system and quality control and safety equipment. A typical equipment layout and production flow diagram is presented in Figure A4-6-1.

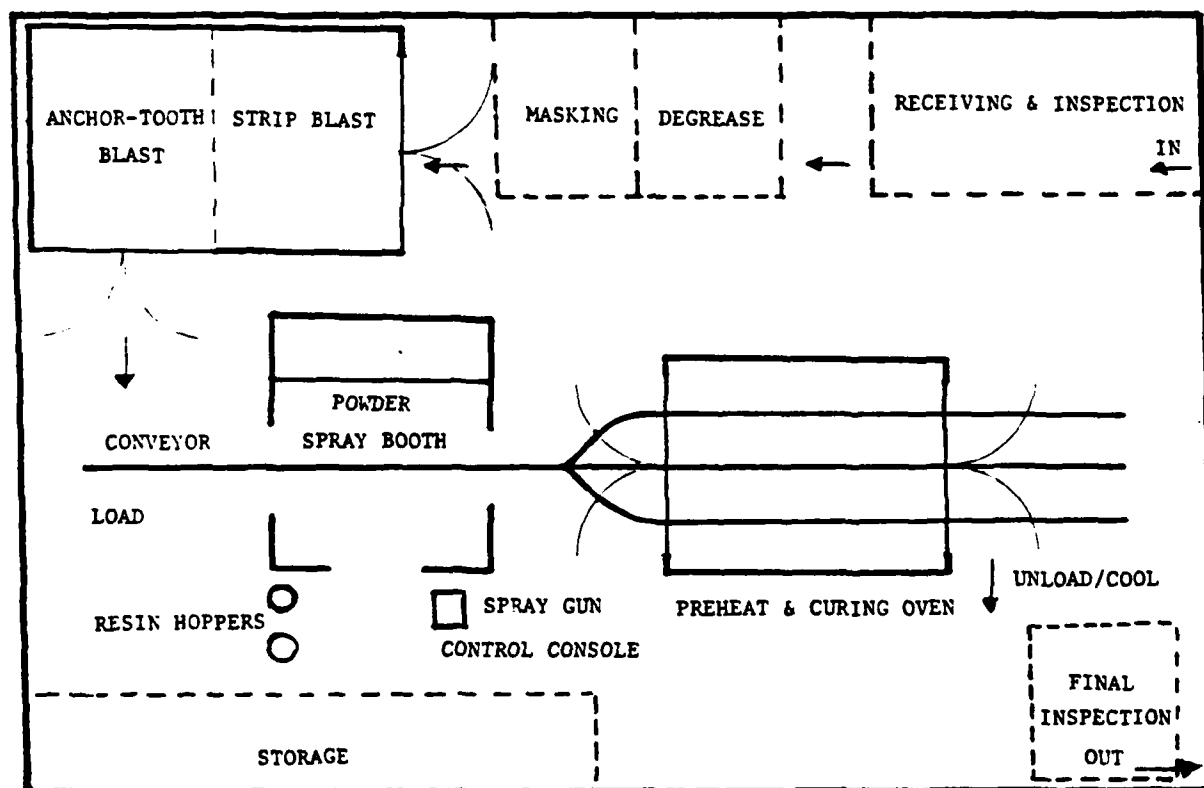


Figure A4-6-1 Powder Coating System, Idealized Equipment Layout

SECTION II

MATERIAL

2.1 RESIN

2.1.1 Powdered Epoxy Meeting ASTM A775/775M-84

The powdered epoxy shall consist of a finely divided powder, grey in color, that shall require no blending, mixing or addition of other compounds to effect a cure. The resin shall be thermosetting (oven cured) when applied in film thicknesses from 8 to 12 mils. The cure temperatures and oven time will depend on the component or item weight. Cure temperatures and cure time will also be effected by preheating of the component.

2.1.1.1 Impact Strength

The cured resin, at a thickness of 8-mils, shall be capable of withstanding a mechanical shock load of not less than 30 in/lb, on direct impact, when tested in accordance with ASTM-D-2794 (Ref. E).

2.1.1.2 Salt Spray Resistance

The cured resin applied to cold rolled steel and given 500 hours minimum exposure in the salt-spray booth shall have less than 1/16 inch creepage from scribe when tested in accordance with ASTM-B-117 (Ref. F).

2.1.1.3 Humidity Resistance

The cured resin shall show no blisters and no change in gloss when tested in accordance with ASTM-D-2247-68 (Ref. G).

2.1.1.4 Weatherability

The cured resin shall sustain 500 hours of exposure in an Atlas Weatherometer without exhibiting chalking, loss of gloss or film deterioration when tested in accordance with ASTM D-822 (Ref. H).

2.1.1.5 Chemical Resistance, Cathodic Disbonding, Chloride Permeability, Flexibility, Abrasion Resistance and Hardness Test

The cured resin shall meet the standards of ASTM A775/A775M-84 (Ref. I) (formerly ASTM A775-81).

2.1.1.6 Shelf Life

The shelf life of the uncured resin shall not be less than one-year from the date of manufacture when stored in original unopened containers below 80°F and 50% \pm 10% relative humidity.

Note: Storage requires environmental control.

2.1.2 Powdered Polyester, Triglycedial Isocyanurate (TGIC), High Performance

Powdered polyester resin shall consist of a finely divided, colored powder that shall require no blending, mixing or addition of other compounds to effect a cure. The resin shall be thermosetting (oven cured) when applied in film thicknesses of 8 to 12 mils. The cure temperatures and oven time will depend on component weight. Cure temperature and time will also be effected by preheating of the component.

2.1.2.1 Impact Strength

The cured resin, at a thickness of 8-mils, shall be capable of withstanding a mechanical shock load of not less than 120 in/lb when tested in accordance with ASTM-D-2794 (Ref. E).

2.1.2.2 Pencil Hardness

The pencil hardness of the cured resin shall not be less than 2H tested in accordance with ASTM-D-3363074 (Ref. J).

2.1.2.3 Cross Hatch

The cured resin shall pass the cross hatch test 100% when tested in accordance with ASTM-D-3359 (Ref. K).

2.1.2.4 Salt-Spray Resistance

The cured resin applied to cold rolled steel and given 1000 hours minimum exposure in the salt-spray booth shall have less than 1/16 inch creepage from scribe when tested in accordance with ASTM-B-117 (Ref. F).

2.1.2.5 Humidity Resistance

The cured resin shall show no blisters and no change in gloss when tested in accordance with ASTM-D-2247-68 (Ref. G).

2.1.2.6 Weatherability

The cured resin shall sustain 500 hours of exposure in an Atlas Weatherometer without exhibiting chalking, loss of gloss or film deterioration when tested in accordance with ASTM D-822 (Ref. H).

2.1.2.7 Chemical Resistance

The cured resin shall be unaffected by continuous 72 hour exposure (immersion) at room temperature to hydrochloric acid (10%), sodium hydroxide (10%), seawater, ethanol (95%) and fuel oil.

2.1.2.8 Shelf Life

The shelf life of the uncured resin shall be not less than one year from the date of manufacture when stored in original unopened containers below 80°F and 50% \pm 10% relative humidity.

Note: Storage requires environmental control.

2.2 ABRASIVE BLASTING MEDIA

2.2.1 Rough Blasting for Cleaning

Any clean and dry blasting media other than silica sand, a mesh size from 30 to 60, may be used to clean painted, rusted/oxidized metallic surface.

2.2.2 Anchor-Tooth Blasting

Abrasive blasting media used to provide the anchor tooth of 1 to 2 mils maximum measured with profile tape (Testex, Inc.) during final surface preparation of the substrate shall be one of the following:

<u>TYPE ABRASIVE</u>	<u>MESH SIZE</u>	<u>SURFACE to be BLASTED</u>
Aluminum Oxide	30 - 80	Steel or Aluminum
Crushed Garnet	30 - 80	Steel or Aluminum
Angular Chilled Iron	30 - 80	Steel

2.2.3 Restrictions

(A) Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

(B) Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been rescreened.

(C) Iron grit shall be reasonably sharp and clean. Grit that is rusty, noticeably worn or dull when compared with new grit under 10X magnification shall not be used.

(D) Angular chilled iron grit shall not be used for blasting of aluminum. Use of iron grit on soft aluminum substrates may result in iron bits becoming embedded in the surface, possibly causing corrosion under the coating and early failure.

(E) Abrasive blasting pots and hoses must be clean and uncontaminated. It is advisable to "dedicate" blasting pots and hoses to the anchor-tooth blasting operation.

2.3 PROCESS AIR

The air equipment used in the abrasive blasting process and the powder coating process shall furnish air which is free of oil and moisture (maximum of 5 mg/m³ of hydrocarbons) and maximum of 35°F dew point at the maximum flow rate (CFM) and maximum pressure (lb/ft²). The air supply shall be adequate to maintain a minimum pressure of 75 lbs. per square inch (lb/in²) at the blast generator.

2.4 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and curing operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various high temperature tapes, plastic caps or plugs. The preferred masking tape is:

Hi-Temp Al Foil Tape (0.007" thick, 3/4" wide x
36 yd. per roll, Stock No. 06004)
T&F Division of SHR Industries
3660 Edison Place
Rolling Meadows, IL 60008
(312) 392-8090

2.5 CLEANING MATERIALS

2.5.1 Solvents

Ethyl Alcohol (denatured) conforming to 0-E-760, toluene conforming to TT-T-548, and trichloroethane conforming to 0-T-620C are approved cleaning solvents.

WARNING:

Toluene and ethyl alcohol are flammable. Ethanol, toluene and trichloroethane are toxic. Use only in well-ventilated spaces. DO NOT use near open flames, blasting, thermal spraying work or sources of sparks. DO NOT allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.5.2 Alkaline

The alkaline cleaning agent is made up of three chemicals: tribasic sodium phosphate dedecahydrate; pentahydrate sodium metasilicate, technical grade; and detergent, nonionic, Type II, water soluble (MIL-D-016791, Type I). The solution shall consist of 8 lbs. sodium phosphate tribasic, 3 lbs sodium metasilicate and 3 pts. water soluble nonionic detergent (MIL-D-016791, Type I) in 50 gallons of fresh water. Refer to NSTM Chp. 631, Section 2 for health and safety requirements (Ref. K). In 0.1N concentrations, these materials are extremely caustic and can be harmful to skin, eyes and any body contact. **USE CAUTION!** Read and follow precautions on container shipping labels before using contents.

SECTION III

SAFETY

3.1 GENERAL

The primary responsibility for safety rests with the individual, non-supervisory personnel who have been assigned to perform the work. The individual's skill level and knowledge of potential hazards is the first guard against unsafe conditions.

The operator's responsibility for safety is shared by his supervisor and all higher levels of management who must ensure that the operator has had the requisite training, is provided sufficient guidance and direction and maintains the required proficiency. In addition, periodic monitoring of all safety requirements should be made to assure they conform to the applicable Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) (Ref. M). Particular attention should be paid to sections 1910.94, 1910.106 and 1910.107. Detailed safety information is given in National Fire Protection Association (NFPA) Standards 33 and 70 (Refs. N and O).

3.2 PRECLEANING

When using solvents or alkaline cleaners, all applicable sections of NSTM, Ch. 631 Section 2 and the applicable NAVOSH Manual apply when performed by Naval personnel. All applicable OSHA rules and regulations shall apply to other industrial activities and manufacturer's safety instructions.

3.3 ABRASIVE BLASTING

When performing abrasive blasting, the current NAVOSH Manual and Sections 631-2.272 through 631-2.288 of NSTM Ch. 631 apply for SIMA(SD) personnel. All applicable OSHA rules and regulations apply to other industrial activities.

3.4 ELECTROSTATIC SPRAY POWDER

3.4.1 Spray Booth

Powder-in-air concentration of greater than 0.05-0.07 oz per cubic foot can be ignited by hot flame or strong electrical discharge. Proper application equipment shall be used to keep powder-in-air concentrations below 0.01 oz/ft. Spray booths are designed for single gun or multi-gun operation. The use of more guns than as specified for the booth will create a dangerous powder-in-air concentration and so must never be done. The spray equipment shall be interlocked with the booth blower so that no powder may be sprayed when the ventilation is shut off. The work floor of the coating area must be electrically conductive. All metal objects within 15 ft. of spray gun must be grounded. **DO NOT spray near any source of ignition.**

3.4.2 Component Suspension Devices

Hangers shall be clean to assure good electrical ground of component and to avoid static electrical discharge. The component shall be well-grounded (0-300 ohms) when the electrostatic voltage is maintained at 50-100 Kv.

3.4.3 Personnel Precautions

3.4.3.1 Respiration - Personnel operating the spray equipment shall wear respiration masks approved by OSHA. These powders are classified as "nuisance dust" and are not toxic. However, if powder gets on skin, it should be removed with soap and water.

3.4.3.2 Electrical - Personnel in the spray area must wear electrically conductive shoes (e.g., leather soles), or leg stats so that there is less than 50 megohms resistance between themselves and earth ground. The operator should hold spray gun in bare hand. If gloves are worn, the palm should be out to assure skin-to-metal contact.

3.4.3.3 Heat - The sprayed component is heat cured to complete coating polymerization. The oven temperatures used are from 325 to 450°F. Personnel handling these components after the cure cycle shall wear heat resistant gloves and use extreme care to avoid contact with exposed skin areas.

3.4.4 Powder Resin

The Material Safety Data Sheet, Form OSHA-20 or equivalent, must be kept on file for each powder product in shop files and SIMA safety office.

SECTION IV

QUALITY CONTROL

4.1 PRODUCTION QUALITY CONTROL

The following inspection procedures shall be followed by the Shop Quality Control Inspector for all ESP coatings work accomplished by the Corrosion Control Shop.

4.2 RECEIPT INSPECTION - A receipt inspection shall be accomplished as follows:

(A) Conduct a visual inspection to determine if welding, structural repairs, removal of prior coatings or further disassembly is required. If repairs are required, notify shop supervisor so item can be routed to applicable shop. If further disassembly is required, advise shop supervisor that further disassembly is required before shop acceptance.

(B) Inspect Ship-to-Shop Tag (Enclosure A4-6-1), attached to the item for completeness and give Part 3 to the ship's representative.

(C) Complete a Production Control Record (Enclosure A4-6-2) and assign a Production Control Number from the Production Control Work Log. Enter this number in the serial number block of the Ship-to-Shop Tag. The Production Control Number will consist of:

- The letter designation of the IMA.
- A sequential four-digit number beginning with 0001.

Example: For an item that was coated at SIMA, San Diego, a typical production control number would be S-0001.

(D) Attach a metal tag with the Production Control Number stamped on it. After the metal tag is attached, remove the Ship-to-Shop Tag and staple it to the Production Control Record.

(E) Release item for precleaning. Free from oil, grease and other contamination. Visual inspection.

(F) Sign the Production Control Record in Section 1 for Receipt and Degreasing Inspection and release item to masking area.

4.3 MASKING INSPECTION - A masking inspection shall be conducted as follows:

(A) Ensure that only masking materials and plugs designed to withstand up to 450°F temperature exposure are used.

(B) Visually inspect items to ensure that all areas not to be coated ("fit and function" surfaces and openings) are either masked off or plugged. Ensure masking is tightly adherent to the substrate and to itself when applied in multiple layers.

(C) Sign Production Control Record in Section 2 for Masking Inspection and release item to strip blasting area.

4.4 STRIP-BLASTING INSPECTION - A strip-blasting inspection will be conducted after strip blasting as follows:

(A) Ensure that all scale, rust and paint has been removed.

(B) Ensure that all masked areas are still intact. Remask as required.

(C) Inspect for warpage, cracks, bad welds or over blast. Take corrective action as necessary to correct any discrepancies.

(D) Random profile measurements are to be taken on the first item strip blasted each morning and each afternoon.

(E) Random grit-mesh-size measurements shall be taken prior to the first daily production run and at the end of the daily production run.

(F) Sign Production Control Record in Section 3 for Strip-Blasting Inspection and release to anchor-tooth blast area.

4.5 ANCHOR-TOOTH-BLAST INSPECTION - An anchor-tooth-blast inspection will be conducted after anchor-tooth blasting as follows:

(A) Visually inspect and ensure that all masked areas are still intact. Remask as required.

(B) Visually inspect and ensure that all areas are uniformly blasted to white metal (SPCC-5).

(C) Measure the anchor-tooth profile using Press-O-Film (x-coarse) and calibrated dial micrometer thickness gage (MITUTOYO #7326 or equivalent).

(D) Ensure that anchor-tooth profile is 1 to 2 mils.

(E) Enter measurement, date and sign Press-O-Film Tab and attach the tab to Production Control Record. Record the anchor-tooth profile measurement, date and time.

(F) Sign Production Control Record in Section 4 for the Anchor-Tooth Blast Inspection.

(G) Release to powder coat ensuring that ESP operation is started within four hours after anchor tooth surface preparation. If more than 15 minutes is expected to lapse between the surface preparation and the start of the ESP process, the prepared anchor-tooth surface shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection.

4.6 POWDER COAT INSPECTION - A post powder coating inspection will be conducted as follows:

(A) Ensure that the ESP process was started within four hours after the anchor-tooth surface preparation.

(B) Visually inspect all components processed. The coating shall be uniform, have no blisters, pinholes, cracks or chips.

(C) The coating's cure shall be checked by lightly tapping the coating with a metal object, such as a putty knife or screw driver. A properly cured coating will be resilient to the metal object. If the coating is brittle and breaks at the point of contact, the coating fails and must be completely removed. Over-cured coatings are typically dull and brittle. If the coating is soft and permanently indented, the object shall be placed in the oven at the curing temperature for another five minutes and again inspected afterwards.

(D) Calibrate thickness gages for ferrous substrates and aluminum substrates at first measurement in the morning and the afternoon. A magnetic flux measurement device is used for non-conductive coatings over mild steel. An eddy-current measurement device is used on non-conductive coatings over aluminum.

(E) Measure each item ensuring that the required coating thickness was attained, 8 to 12 mils. Thickness measurements will be taken in at least five random locations. If the coating thickness is unacceptable, the item shall be rejected.

(F) Sign Production Control Record in Section 10 for Proper Cure Check and Cured Coating Thickness. Record the high and low thickness measurements taken, the date and time.

(G) Release to silicone alkyd paint topcoating process. The powder coated surface shall be protected from moisture, contamination, fingermarks and chipping.

4.7 SILICONE ALKYD TOPCOAT

(A) Measure dry film thickness of final topcoat. Ensure that the measured dry film thickness is a minimum of 1.5 mils. Sign Production Control Record in Section 11. Include measured dry film thickness, date and time.

(B) Measure total dry film thickness. Sign Production Control Record in Section 12. Include measured dry film thickness, date and time.

(C) Ensure that a minimum of twenty-four hours elapses between the application of the topcoat and routing to final assembly area.

(D) Release to final assembly area.

4.8 FINAL ASSEMBLY INSPECTION - A final assembly inspection will be conducted as follows:

(A) Ensure that all masking and plugging material is removed.

(B) Ensure that, if required, installation kit and instructions are complete and are attached.

(C) Ensure that item is properly protected and stowed in such a manner as to protect all coated surfaces for the transport from the CC Shop to installation on the customer ship.

(D) Remove metal identification tag, discard and re-attach Ship-to-Shop Tag.

(E) Sign Production Control Record in Section 13 for Final Assembly Inspection and Packaging.

(F) Remove Part 2 of Ship-to-Shop Tag and notify Shop Supervisor that item is ready for pickup.

(G) When Ship's Force picks up item, complete and attach Parts 1 and 3 of Ship-to-Shop Tag to Production Control Record.

SECTION V

METHOD

5.1 POWDER COATING PROCESS

The method for applying electrostatic spray powder coatings is given as follows:

5.2 RECEIPT INSPECTION

Refer to paragraph 4.2.

5.3 PRECLEANING

The item shall have any oils or grease removed by solvent or alkaline cleaning agents as stated in paragraph 2.5.

5.4 MASKING

Refer to paragraph 2.4.

(A) All threaded areas must be masked. Only high-temperature tape and plugs designed to withstand up to 450°F shall be used.

(B) As little masking as possible should be used on items to be powder coated so that as much of the item's surface as possible will be protected by the powder coat.

(C) Inspection of item, reference paragraph 4.3.

5.5 STRIP BLASTING

Refer to paragraph 2.2.1. Items shall be strip blasted to remove all old paint and corrosion products.

(A) Care must be exercised where stripping thin gage metals to prevent product warping or any other damage.

(B) Grit sizes of 30-60 mesh shall be used to prevent too large of an anchor pattern from being made on the surface.

(C) Strip blasting inspection shall be conducted as stated in paragraph 4.4.

5.6 ANCHOR-TOOTH BLASTING

Refer to paragraph 2.2.2. Anchor-tooth blasting is conducted to guarantee the presence of a surface profile for mechanical bonding by the coating and to clean the surface of contamination left by the strip blasting operation.

(A) Items shall be anchor-tooth blasted to a white metal finish (SSPC-SP5) using clean grit to ensure that the proper anchor tooth of 1 to 2 mils is provided and that any contamination left from the strip blasting grit is removed. The anchor-tooth profile is measured using Press-O-Film (coarse) and calibrated dial micrometer.

(B) Care must be exercised to prevent damaging thin-gage items. Anchor-tooth blasting should be conducted as a quick sweep of the surface, not as a metal removal procedure.

(C) After the item has been blasted, it shall be cleaned of all grit and dust by using an air gun and lint-free rags. Additional cleaning can be accomplished with denatured alcohol.

(D) The cleaned item shall be protected from moisture, contamination and fingerprints.

(E) Anchor-tooth blast inspection shall be conducted as stated in paragraph 4.5.

5.7 PREHEAT

Component preheating is required to both free the object of moisture and provide a hot surface for the powder to build up thickly when applied. Once preheated, the component should be transferred to spray area as quickly and safely as possible.

5.7.1 Thin-Gage Steel and Aluminum. These components shall be preheated for at least 15 minutes at the cure temperature, unless otherwise specified by powder manufacturers.

5.7.2 Steel Castings. Steel castings shall be preheated for one hour 25°F above the cure temperature.

5.7.3 Aluminum Castings. Aluminum castings shall be preheated for half an hour at the cure temperature.

5.8 ELECTROSTATIC SPRAY POWDER APPLICATION

Refer to paragraph 2.1. Powder coating can be done in a one-coat or two-coat process depending on the type of resin and/or the coating equipment operator. Only personnel familiar with applying the resin correctly should be permitted to coat actual production items.

5.8.1 Receipt. Coating equipment and booth should be immediately operational upon receipt of preheated item.

5.8.2 Grounding. The components conveying/suspension system must be electrically grounded before electrostatic spray gun is operated.

5.8.3 Powder Coating in a Single Coat Operation. If conditions are such that the part can be coated with 8 to 12 mils of the desired resin in one coat, than this is the preferred operation. Conditions allowing this include: components mass (heat retention), powder formulation, grain size, time between preheat and spraying and operator skill.

- (A) Interior areas sharp corners and edges shall be coated first.
- (B) Surfaces should be coated over slowly and completely three times. The most powder shall be delivered on the first pass, due to a lessening of electrostatic attraction as thickness increases. If powder begins to fall off of object, immediately cease coating that object and check for clumps.
- (C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.
- (D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever first depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.
- (E) Once all components are sprayed, they shall be returned to the oven immediately for complete curing (refer to Section 5.9).

5.8.4 Powder Coating in a Two-Coat Operation. If conditions are such that the part must be coated with 8 to 12 mils of the desired resin in two coats, then perform the following:

- (A) Interior areas sharp corners and edges shall be coated first.
- (B) Surfaces should be coated over slowly and completely three times. The most powder shall be delivered on the first pass, due to a lessening of electrostatic attraction as thickness increases. If powder begins to fall off of object, immediately cease coating that object and check for clumps.
- (C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.
- (D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.
- (E) Return sprayed parts to curing oven for 5 minutes to gel the coating.
- (F) Repeat 5.8.4.1.

(G) Return components to oven for complete cure (refer to section 5.9).

5.9 CURING

The coating is cured at the temperature specified by the resin manufacturer. Manufacturers provide a range of temperatures and time schedules. The operators should choose one that provides a complete cure in 10-20 minutes.

5.9.1 Cure Time. The parts should remain in the oven for the complete cure time if they are to be single coated or are in the second coat of a two-coat operation.

5.9.2 Cool Down and Coating Inspection. Upon curing, the parts are removed from the oven. The coating should be checked for brittleness or completeness of cure while still hot by tapping it with a metal object, such as a screw driver or putty knife. Allow the component to cool, then check coating thickness as specified in paragraph 4.6.

5.10 SILICONE ALKYD PAINT TOPCOAT

The application of a topcoat of silicone alkyd paint shall be applied in accordance with reference P.

5.10.1 Receipt - The powder coated component shall be checked for cleanliness upon receipt in paint spray area.

5.10.2 Paint - The paint, TT-E-490, shall be applied in accordance with NSTM Chapter 631.

5.10.3 Coating Thickness - The topcoat and total coating thickness shall be inspected as stated in paragraph 4.7.

5.11 FINAL INSPECTION AND PACKAGING

Refer to paragraph 4.8 for final inspection and packaging.

SECTION VI

FEEDBACK

6.1 FEEDBACK INDICATIONS

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

(A) Verbal and written reports from customer ships and shops.

(B) Weekly analysis of the CC Shop's:

- Production input to output
- Labor and materials consumed
- PM/CM activity
- QC activity and results
- Product degradation/failure reports

SHIP TO SHOP TAG (GENERAL USE)		
TAG _____ OF _____		
SURFGEN QA FORM 9090/4A (1/79) S/N 0116-LF-890 9020 (PART 1)		
SHIP _____		
JCN _____		
EIC/APL _____	SER. NO. _____	
JOB BRIEF/EQUIP. NOMENCLATURE _____		
LEAD W/C _____	DATE REC'D _____	DELIVERED BY _____
ATTACH PART 1 AND PART 3 TO COMPLETED WORK REQUEST AFTER PICK UP BY SHIP		
READY FOR PICK UP TAG (PART 2)		
SHIP _____		
JCN _____		
EIC/APL _____	SER. NO. _____	
JOB BRIEF/EQUIP. NOMENCLATURE _____		
LEAD W/C REP. _____ DATE _____		
CUSTOMER MATERIAL RECEIPT (PART 3)		
SHIP _____		
JCN _____		
JOB BRIEF/EQUIP. NOMENCLATURE _____		
REC'D BY _____	DATE _____	
DELIVERED BY _____	DATE _____	
SHIP'S ENGINEER SHALL RETAIN THIS TAG (PART 3) AS RECEIPT FOR MATERIAL DELIVERED TO THE TENDER.		

Enclosure A4-6-1

**CORROSION CONTROL SHOP
POWDER COATING
PRODUCTION CONTROL RECORD**

USS _____
Ship _____ Hull Number _____

Job Control Number (JCN) _____

Production Control Number _____

Item Description _____ Location Deck Frame Side _____

TYPE COATING:

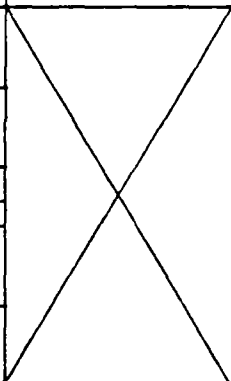

Epoxy
(Meeting ASTM A775)

FINISH COLOR:

_____ Haze Gray TT-E-490

_____ White TT-E-490

_____ Other _____

SECTION	PROCESS SEQUENCE INSPECTIONS	DATE	TIME	SHOP QCI SIGNATURE	
1.	Receipt, Degrease				
2.	Masking <div>Plug Tape</div>				
3.	Strip				
4.	Anchor Tooth 1-2 mils <div>mils</div>				
5.	Start Preheat Oven at 400°F <div>Temp</div>				
6.	End Preheat 0.5 to 1.0 hr				
7.	Powder Spray <div>1. 2.</div>				
8.	Begin Curing Oven at 400°F <div>Temp</div>				
9.	End Curing 10-15 min				
10.	Proper Cure Check and Cured Coating Thickness - 8-12 mils <div>mils</div>				
	TOPCOAT		Date	Time	ATTACH PROFILE TAPE HERE
	Type/DFT Rqmt	Measured DFT			
11.	TC/1.5 mils				
12.	Final Thickness				
13.	Final Assembly Inspection, Packaging				

Enclosure A4-6-2

APPENDIX A4-7
RECOMMENDED PMS PROCEDURES

1.0 GENERAL

The enclosed maintenance procedure package has been presented to SIMA(SD) to serve as a basis to develop a standard SIMA PMS program.

2.0 PMS PACKAGE DEVELOPMENT

The maintenance procedures specified for each piece of equipment were derived from the equipment-manufacturer's recommendations and shop experience. Standard SIMA maintenance and safety procedures, codes and format are still required prior to implementation. SIMA PMS, Code 8220, has received this preliminary package for review, standardization and implementation.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Vapor Degreaser

Configuration

Reference Publications

Randall Manufacturing Co, Inc., Vapor Degreaser Manual

Periodicity Code

Maintenance Requirement Description

S

a. Clean Strainer and Sludge Trays.

1. Remove fastener (s) from strainer housing.

2. Remove strainer housing.

3. Remove strainer.

WARNING: Avoid prolonged contact with, or inhalation of, cleaning solvent. Avoid use near heat or open flame and provide adequate ventilation.

4. Clean strainer with solvent-soaked rag; inspect for tears and particles lodged in mesh screen.

5. Reinstall strainer.

6. Reinstall strainer housing.

7. Reinstall fastener (s).

8. Remove sludge trays.

9. Clean trays with solvent-soaked rag.

10. Reinstall trays.

Note: Gray-Mills Model 100 may be equipped with sludge trays; delete steps 1.h through 1.j. if not applicable.

R

a. Clean solvent tank; renew solvent.

1. Start machine. Accomplish when solvent becomes dirty and can no longer be effectively cleaned by strainer.

WARNING: Avoid prolonged contact with,

or inhalation of, cleaning solvents.
Avoid use near heat or open flame and
provide adequate ventilation.

2. Turn valve to AGITATE/FLUSH
position.

3. Pump solvent into drum (s).

4. Stop machine.

5. Remove drain plug/open valve;
drain remaining sludge.

6. Clean tank with solvent-soaked
rag.

7. Clean and reinstall drain
plug/close valve.

8. Fill tank with new solvent.

LU

a. Install protective covering over
cleaning tank.

SU

a. Remove protective covering from
cleaning tank.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Strip-Blast Unit

Configuration

Reference Publications

Periodicity Code

Maintenance Requirement Description

DR

a. Inspect all air fittings, and hoses for tightness, cracks and holes. Repair or replace as needed.

b. Inspect operation of sludge pumps and tank.

c. Inspect grit.

1. Empty small amount of grit into bucket.

2. Place grit into 8 oz sample bottle.

3. Inspect grit for dust and oil.

4. Replace grit as needed.

d. Inspect grit-shaker screen.

1. Sweep out any debris.

2. Insure shaker mounting bolts are tight.

3. Insure rubber skirt is overlapping screen edges.

W

a. Remove sludge pump filter.

1. Clean with water hose. Flush until filter is free of sludge and clean, clear water is flowing from filter.

2. Inspect the 200-Mesh screen for holes. Report damaged screen to shop supervisor and note for replacement.

3. Reinstall screen.

b. Clean and inspect water-spray nozzles.

1. Tag out water pump control panel.
2. Open access door to water nozzle manifold.
3. Remove manifold.
4. Attach water hose to manifold with water flowing through manifold.
5. Inspect nozzles for even spray pattern.
6. Replace worn nozzles.
7. Reinstall manifold.
8. Tag in control panel.

Q

a. Perform pressure lubrication.

1. Perform tag out procedures.
2. Wipe grease fittings.
3. Inject grease through grease fittings.
Note: 2 grease fittings on fan shafting.
1 grease fitting on pump gland.
4. Remove safety tag and energize circuit.

b. Clean drive belts.

1. Perform tag out procedures.
2. Wire roller and gear.
3. Lubricate roller and gear.
4. Remove tag.

S

a. Inspect drive belts.

1. Perform tag out procedures.
2. Depress belt halfway between pulleys. Belts should depress 1/2" to 3/4".
3. Inspect belts for wear.

4. Remove safety tag and energize circuit.

R

a. Clean settling tank residue and sludge.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Deadman Switch and Hoses, Strip-Blast Unit

Configuration

Reference Publications

Periodicity Code

D

Maintenance Requirements Description

- a. Insure safety guard of handle functions properly.
- b. Clean blast media from underneath handle.
- c. Inspect hose for wear and leaks.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Breathing Air, Strip-Blast Unit

Configuration

Reference Publications

Periodicity Code

Maintenance Requirement Description

W

- a. Secure air supply to unit.
- b. Remove bottom of Wilkerson prefilter unit by pulling the two pins straight out.
- c. Clean internal glass cups and baffle plates using a mild detergent, clean water and clean rags.
- d. Reinstall cover.
- e. Remove aluminum cap cover and replace fine-mesh paper filter.
- f. Replace aluminum cap cover.

M

- a. Check water level in cooling tank. Refill as necessary.
- b. Replace disposable filter outside building (ladder required).

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Remote-Control Blast Valve, Strip-Blast Unit

Configuration

Reference Publications

Periodicity Code

D

Maintenance Requirement Description

- a. Insure safety petcock on the inlet valve is secured.
- b. Insure abrasive trap is clean.
- c. Inspect all hoses of hose connections for wear.

PMS REQUIREMENTS

Shipsystem, System, Subsystem, or Equipment
Anchor-Tooth Blast Container

Configuration

Reference Publications

Periodicity Code

Maintenance Requirements Description

Abrasive Trap

- D a. Clean the abrasive trap twice daily.
Poor abrasive trap maintenance is a major cause of system malfunctions.
- R a. Replace abrasive-trap screen when it is worn or excessively clogged. A spare screen should be kept on hand at all times.

Blast Hose/Nozzle

- R a. If neither air nor abrasive come out the nozzle during blasting, depressurize the machine and check the nozzle to see if it is clogged. If air comes out but not abrasive, open and close the choke valve rapidly.

Exhaust Trap

- D a. Clean and remove abrasive in exhaust trap screen.
- b. Clean out dust trap and collector with a vacuum cleaner.
- W a. Add one or two drops of oil in the inlet valve through the safety petcock.
- R a. The inlet and outlet valves should be subject to periodic internal inspection. Inspect for wear and lubrication on o-rings, pistons and springs.

Blast Pot

- D a. Inspect condition of abrasive grit.

Dust Collector

- DR a. Inspect and clean dust collect.

Shake dust bags at least once every four hours of operation.

1. Changing Filter Bags

- o Remove panels on dust-collector plenum and bag house.
- o Remove two Z-brackets on each side of dust bags.
- o Remove L-shaped bracket at end of each set of bags.
- o Remove bags up through plenum area.
- o Remove all foam tape and sealing material.

2. Installing New Dust Bags

- o Replace all foam tape around entire opening.
- o Replace dust bags in each opening.
- o Replace L-shaped brackets.
- o Replace Z-shaped brackets.

Note: Very Important

- o Each set of bags must be sealed so that no air leaks between the clean side of the bags and the dirty side.
- o After replacing bags, a small amount of dust may be emitted from the blower exhaust until the bags are seasoned. If this persists, check seals around the dust bags.

Blast Room

WR

- a. Inspect lights and screens. Screens should be tight and free of tears. Replace screws and light bulbs as needed.
- b. Inspect rubber matting on walls for holes. Replace or repair as necessary.
- c. Inspect metal strips on walls.

Replace or repair as necessary.

d. Inspect all gaskets and seals on blast room, dust collector and cyclone.

e. Inspect condition of ducting and floors.

FMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Blast Helmet

Configuration

Reference Publications

Periodicity Code

Maintenance Requirement

R

a. If the air control valve becomes difficult to move, it may be necessary to remove the sleeve and blow out accumulated dust and particulate matters with compressed air.
See detailed manufacturer instructions.

b. The cape, suspension and inner collar can be machine washed using warm soap and water, and dried in a clothes dryer at the lowest-temperature setting. It should not be dry cleaned.
The helmet assembly and belt can be washed with mild soap and water; however, DO NOT IMMERSE THE HELMET IN WATER! Mild soap and water can be used to clean the inner lens.

c. When the inlet foam filter becomes soiled, pry the retaining ring out with a small screwdriver. Remove the screen and dirty filter. A new filter, screen and retaining ring (available as a kit) can then be installed. Wipe clean; inspect lenses (re-install).

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment

Remote-Control Blast Valves and Deadman-Switch, Anchor-Tooth-Blast Container

Configuration

Reference Publications

Flame Spray, Inc.- Series 5000 Blast Container Technical Manual

Periodicity Code

Maintenance Requirement Description

D

a. Clean abrasive trap on remote-control blast valve.

b. Inspect hoses and hose connection for leaks.

c. Inspect deadman-switch operation.

FMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Chain Hoist, Anchor-Tooth-Blast Container

Configuration

Reference Publications

Flame Spray Inc.-Series 5000 Blast Container Technical Manual

Periodicity Code

Maintenance Requirements Description

- | | |
|---|--|
| D | a. Check the hoist condition. Blow out prior to use to remove all dust from operating mechanisms. |
| R | a. Visually check hoist after each use. |
| A | <p>a. The following are preventive maintenance steps which should be performed periodically as operating conditions demand. Under most conditions, a yearly maintenance inspection is adequate. The entire hoist should be relubricated as outlined in the tech manual. If the hoist has been subjected to extremely-adverse conditions, such as excessive dirt or moisture, a more-frequent maintenance inspection should be made.</p> <p>b. Weight-test monorail and chainfall. Contact PWC.</p> |

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Wire-Spray Container

Configuration

Reference Publications

Flame Spray, Inc.-Series 5000 Container Technical Manual

Periodicity Code

Maintenance Requirement Description

D

- a. Clean up all loose aluminum dust particles from spray booth using the proper safety equipment.
- b. Inspect all air and water valves and piping for proper operation. Observe for one full cycle.
- c. Inspect and operate water pump.
- d. Inspect water level in water wash tank.

M

- a. Inspect all doors and vents for proper operation.

QR

- a. Clean settlings tank of overspray residue and sludge.
- b. Clean and inspect baffle plates, nozzles and filter.

S

- a. Inspect drive belt.

R

- a. Remove aluminum build up from fixed table and/or turntable.
- b. During cold weather ensure heat lamp is directed on the METCO spray gun when the gun is not in use.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Wire-Spray-Aluminum 12-E METCO Gun

Configuration

Reference Publications

METCO 12E Flame Spray Gun Technical Manual

<u>Periodicty Code</u>	<u>Maintenance Requirement Description</u>
D	<ul style="list-style-type: none">a. Insure nozzle nut is hand tight.b. Inspect nozzle assembly.c. Insure air cap body is hand tight.d. Check gas-head valve for smooth operation.e. Check gear-case lubrication level.f. Operate turbine speed by speed control ring.g. Inspect wire snubber for proper operation.h. Inspect and clean wire-drive rollers.i. Clean outside of gun.j. Clean nozzle with tip cleaner.
W	<ul style="list-style-type: none">a. Clean siphon plug.b. Oil upper-drive-roll bushing.c. Oil upper-drive-roll carrier hinge.d. Lubricate turbine-cover bearing.e. Lubricate gear case.
M	<ul style="list-style-type: none">a. Clean turbine brake disc and shoe.b. Clean and relubricate control-ring thread.c. Clean and relubricate power-control spider.d. Lubricate wire-grip cam assembly.e. Lubricate cam follower.
Q	<ul style="list-style-type: none">a. Clean and lubricate gas-head valve.
SR	<ul style="list-style-type: none">a. After 1,000 hours of use, completely overhaul.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Wire-Sprayed-Aluminum Air Drier

Configuration
VanAir Regenerative Air Driers

Reference Publications
Flame Spray, Inc. Series 5000 Container Technical Manual

<u>Periodicity Code</u>	<u>Maintenance Requirement Description</u>
	<u>Aftercooler</u>
D	a. Check operation of separator and float trap.
N	a. Clean finned tubes by blowing-off dust and dirt with compressed air. Do not use stiff brushes as aluminum fins are easily damaged.
R	a. Clean tube interiors when compressor has been pumping excessive amounts of oil by disconnecting piping with inlet and outlet manifolds. Use a pump to circulate a cleaning solution until the oil and carbon build-up is removed.
	<u>Pressure Differential Gauge</u>
M	a. Clean gauge block bore and piston with mild degreasing solution and soft brush.
	<u>Regenerative Air Drier</u>
D	a. Check for proper operation by: 1) Verifying that tower pressures are cycling properly by watching pressure gauges for one-full cycle. 2) Checking differential-pressure gauges to determine whether filter elements require replacing. 3) Verifying proper operation of safety-relief valve by pulling try lever several times. 4) Inspecting purge muffler for obstruction. 5) Examining purge muffler for signs of oil. If oil is present, desiccant bed may be

coated with oil. Refer to tech manual.
6) Checking the afterfilter for signs of oil. This is a sign of severe oil contamination problems. Check wiring connections. Tighten if necessary.
7) Checking control air filter for dust.

- S a. Replace control filter at least once every six months.

Oil-Coalescer Filter, After-Filter and Pre-Filter

- R a. Replace when differential pressure reaches 10 PSI or after 200 hours of operation.

Automatic Drain Trap

- D Check operation to ensure no blockage.

FMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Wire-Sprayed-Aluminum Air Control Unit and Flowmeters

Configuration

METCO 4A Air Control Unit
METCO 2GF Gas Flowmeter
METCO 2AF Air Flowmeter

Reference Publications

METCO 12E Flame Spray Gun Technical Manual

<u>Periodicty Code</u>	<u>Maintenance Requirement Description</u>
------------------------	--

Air control unit

- | | |
|---|--|
| D | a. Check both filter bowls and drain them before the condensate reaches the baffle. The condensate level is shown by the sight glass on each bowl. It should not be permitted to rise into the red. Note that the T-handle on the drain turns counter-clockwise to open, clockwise to close. |
| M | a. Clean both filter screens <ol style="list-style-type: none">1. Shut off the air to the unit.2. Remove the filter bowls by turning counter-clockwise.3. Unscrew the baffles.4. Remove the screens and wash them in METCO Cleaning Solvent.5. When reassembling:<ol style="list-style-type: none">a. Tighten the baffles no more than hand snug.b. Apply a thin coating of METCO Ringlube to each bowl O-ring.c. Apply an even coating of an anti-seize compound (Ringlube is satisfactory) to the full length of the threads on each bowl. Fully tighten each bowl to stop (approximately five turns) and then unscrew no more than one full turn to position the sight glass. |

Air and Gas Flowmeters

- | | |
|---|--|
| D | a. Clean outside of flowmeter using a clean rag only. -CAUTION- DO NOT USE SOLVENTS. |
| | b. Contamination which enters the flow- |

meter requires complete disassembly and cleaning of unit. (Contamination will be noticed by discoloration or fluid build-up in flow meter tube).

Air Flow Regulator

R

a. If the regulator creeps, or air flow is limited, proceed as follows:

1. Shut off the air to the unit. Bleed air downstream of the shut-off so the filters and regulators are completely depressurized.
2. Disconnect the unit from the line.
3. Turn out the adjusting screw to relieve all spring compression.
4. Remove the valve guide plug.
5. Take out the valve and valve spring. Clean the valve, valve spring and valve guide plug with warm water and soap. Inspect these parts and the valve seat carefully. Watch especially for wear on valve sealing surfaces. If any part is damaged, replace it. If the valve seat is replaced, tighten to 80-100 inch pounds of torque.
6. When reassembling, the regulator must be in a vertical position. Apply a generous coat of lubricant grease to the valve o-ring and the bore of the valve guide plug. Apply a light coat of lubricant to the valve guide plug gasket.

b. If regulation is uneven, or air leaks through the hole in the bonnet, disassemble the regulator and look for a rupture in the diaphragm or improper sealing around the edge. If necessary, replace the diaphragm.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Chain Hoist, Wire-Spray Container

Configuration

Reference Publications

Flame Spray Inc.-Series 5000 Blast Container Technical Manual

<u>Periodicity Code</u>	<u>Maintenance Requirement Description</u>
D	a. Check the hoist condition. Blow out prior to use to remove all dust from operating mechanisms.
R	a. Visually check hoist after each use.
A	a. The following are preventive-maintenance steps which should be performed periodically as operating conditions demand. Under most conditions, a yearly maintenance inspection is adequate. The entire hoist should be dismantled and its parts inspected for damage or wear and replaced as necessary. At reassembly, the hoist should be relubricated as outlined in the tech manual. If the hoist has been subjected to extremely adverse conditions, such as excessive dirt or moisture, a more-frequent maintenance inspection should be made. b. Weight-test monorail and chainfall. Contact PWC.

PMS REQUIREMENTS

Shipsystem, System, Subsystem or Equipment
Water-Wash Paint Spray Booth

Configuration

Reference Publications

<u>Periodicity Code</u>	<u>Maintenance Requirement Description</u>
M	<ul style="list-style-type: none">a. Adjust exhaust-fan belt tension ($3/4$" of movement of belt is acceptable).b. Drain tank. Remove sludge from bottom. Refill tank.
Q	<ul style="list-style-type: none">a. Grease blower and pump motors.b. Grease fittings on exhaust fan and pump.c. Clean baffle plates and nozzles.d. Clean exhaust screen and ducting.
S	<ul style="list-style-type: none">a. Inspect drive belts.<ul style="list-style-type: none">1. Depress belt halfway between pulleys. Belts should depress $1/2$" to $3/4$".2. Inspect for wear.
A	<ul style="list-style-type: none">a. Inspect foundation bolts for tightness.
R	<ul style="list-style-type: none">a. Clean and inspect spray booth interior.

PMS REQUIREMENTS

Shipsystem System, Subsystem or Equipment
GRACO Air Spray Gun Model 700N and 800

Configuration

Reference Publications

700-N-GRACO Instruction/parts list. 307-452

800-GRACO Instruction/parts list. 307-380

Periodicity Code

D

Maintenance Requirements Description

a. At the end of each production day, clean the gun.

1. Flush with a compatatible solvent until all traces of paint are removed from the gun passages and a continous pattern of clean solvent is spraying. Apply for 30 seconds.

2. Shut off air supply.

3. Remove and inspect the air cap and fluid tip. Soak in solvent and clean with a fine-bristled brush. To clean holes in air cap and fluid tip, use a toothpick or other soft instrument to avoid damaging critical surfaces. CAUTION- Do no clean with metal objects such as oxygen/acetylene tip cleaners or drill bits.

4. Reinstall fluid-tip and air cap. Spray solvent though gun.

5. Shut of air supply.

6. Wipe outside of gun with a solvent-dampened cloth.

7. Clean and dry paint container inside and outside.

b. Lubricate the gun using a light oil at the following places.

- 1) Lube hole on top of gun
- 2) Air valve tip
- 3) Needle packing kit

W

- a. Lubricate the fluid-needle spring

with a lightweight grease or petroleum
jelly.

Note: For identification of parts and additional trouble-
shooting, it may be necessary to refer to the diagram in the
manufacturers instruction/parts-list booklet.

APPENDIX A6-1

SHIP CLASS FASTENER INVENTORY REQUIREMENTS

1.0 INTRODUCTION

Fastener requirements for each ship class are required in order to install a pre-expanded bin (PEB) of improved fasteners at a SIMA. The development of ship class fastener requirements consisted of touring a ship of each ship class and identifying each component that could be processed through a SIMA CC Shop for the type, size, material and quantity of all fasteners required to properly reinstall each processed component.

This data was tabulated on a Zenith Data Systems Z100 computer utilizing LOTUS 1-2-3 software.

The data is divided into four sections for each ship class. These sections include 316-stainless steel (SS) fasteners, ceramically-coated fasteners, 316-SS toggle pins and watertight closure parts. Ceramically-coated fasteners are utilized where the fastener strength requirement exceeds that of 316-SS or when mounting the component to an aluminum substrate, i.e., bulkhead.

This data should be developed for the remaining ship classes of the fleets. The ATS and AO-177-Class ships have been toured and data taken but not collated at this time. Further development of ship class fastener inventory requirements would allow for the establishment of a PEB inventory at any port with any ship class combination. As ship classes are added to a port, additional fasteners should be added to the PEB utilizing the ship class inventory sheets.

The establishment of a PEB inventory utilizing ship class inventory sheets would allow for an on-hand stock of improved fasteners for the return of preserved components to a ship with proper fasteners.

316 - 55 TOGGLE PINS					WATERTIGHT CLOSURE PARTS	
DIAMETER (IN)	LENGTH (IN)				DESCRIPTION	QUANTITY
5/8	2	2 1/2	3	3 1/2	HINGE PIN (RAISED HATCH)	28
					WASHER (RAISED HATCH)	28
	0	0	4 1/2	4	COTTER PIN	252
					HINGE PIN (SCUTTLE)	28
					COLLAR (SCUTTLE)	28
					UPPER LINK PIN (SCUTTLE)	14
					LOWER LINK PIN (SCUTTLE)	14
					COLLAR (LINK PIN)	14
					HINGE PIN (DOOR)	224
					COLLAR (DOOR)	224

LSD36 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)							LOCK NUTS	HEX NUTS	FLAT WASHERS	NYLON WASHERS	PYRO CLIP
	3/4	1	1 1/2	1 3/4	2	2 1/2	3	3 1/2				
1/4	0	3610	0	0	0	0	0	0	3610	0	8064	0
5/16	36	236	248	0	0	32	0	0	484	0	1630	236
3/8	638	2806	568	84	168	128	0	0	3644	656	7880	1188
1/2	0	0	116	0	18	208	0	0	152	308	684	1116
5/8	0	48	0	0	0	0	0	0	0	0	0	0
3/4	0	0	6	0	6	0	4	0	16	32	224	0
1	0	0	0	0	0	0	0	4	12	2	20	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)							HEX NUTS	FLAT WASHERS
	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2		
3/8	0	0	0	0	0	0	0	0	16
1/2	144	0	32	0	32	0	72	0	432
5/8	0	0	0	168	32	154	0	4	760
3/4	0	64	0	48	0	0	0	0	160

WATERTIGHT CLOSURE PARTS

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)		DESCRIPTION	QUANTITY
	2 1/2	3		
1/4	0	18	HINGE PIN (RAISED HATCH)	28
1/2	122	0	WASHER (RAISED HATCH)	28
3/4	0	486	COTTER PIN	252
			HINGE PIN (SCUTTLE)	28
			COLLAR (SCUTTLE)	28
			UPPER LINK PIN (SCUTTLE)	14
			LOWER LINK PIN (SCUTTLE)	14
			COLLAR (LINK PIN)	14
			HINGE PIN (DOOR)	224
			COLLAR (DOOR)	224

FFB7 SHIP CLASS
316 - SS FASTENERS

DIAMETER	LENGTH (IN)										HEX NUTS	LOCK NUTS	FLAT WSHRS	NYLON WSHRS	PYRO CLIP
	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4	6	8	10	12	14
1/4	0	136	700	120	0	0	0	0	0	0	0	0	1948	2910	0
5/16	0	84	520	0	0	0	0	32	0	0	0	0	644	676	520
3/8	56	506	1292	144	668	90	40	112	0	0	0	2400	4678	5464	720
1/2	0	56	0	32	264	0	100	164	20	44	0	0	1416	2182	0
5/8	0	0	0	0	0	0	128	0	0	16	0	0	336	368	0
3/4	0	0	56	2	0	0	0	0	52	8	0	0	234	234	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)										HEX NUTS	FLAT WSHRS
	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4	4 1/2	5	6	8	10
3/8	24	0	88	8	24	0	0	0	0	0	160	336
1/2	36	12	16	76	82	6	0	0	2	232	470	32
5/8	0	0	0	0	16	0	0	0	0	16	0	0

WATERTIGHT CLOSURE PARTS

DESCRIPTION	QUANTITY
HINGE PIN (RAISED HATCH)	36
WASHER (RAISED HATCH)	36
COTTER PIN	80
HINGE PIN (SCUTTLE)	52
COLLAR (SCUTTLE)	52
UPPER LINK PIN (SCUTTLE)	26
LOWER LINK PIN (SCUTTLE)	26
COLLAR (LINK PIN)	26
HINGE PIN (FLUSH DECK HATCH)	12
WASHER (FLUSH DECK HATCH)	28
HINGE PIN (DOOR)	44
COLLAR (DOOR)	44

FFG1 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)										PYRO CLIP
	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	4	4 1/2	6 1/2	
1/4	136	424	0	0	16	0	0	0	0	0	0
5/16	204	0	0	0	0	0	32	0	0	0	132
3/8	438	358	8	48	92	194	0	0	0	0	236
1/2	32	0	64	244	0	224	0	0	0	0	2124
5/8	0	0	0	0	0	0	0	0	0	0	1332
3/4	0	32	0	0	0	36	4	0	0	0	212
											500

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)										HEX NUTS	FLAT WSHRS
	1 1/4	2	2 1/2	3 1/2	4	6	HEX NUTS	FLAT WSHRS				
3/8	16	0	0	0	12	0	76	104				
1/2	24	56	0	0	0	28	140	124				
5/8	0	36	16	64	0	0	80	196				
3/4	0	0	0	132	0	0	132	384				

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)		DESCRIPTION	QUANTITY
	2	6		
1/2	76	0	HINGE PIN (RAISED HATCH)	16
5/8	0	106	WASHER (RAISED HATCH)	16
			COTTER PIN	128
			HINGE PIN (SCUTTLE)	12
			COLLAR (SCUTTLE)	12
			UPPER LINK PIN (SCUTTLE)	6
			LOWER LINK PIN (SCUTTLE)	6
			COLLAR (LINK PIN)	6
			WASHER (FLUSH DECK HATCH)	12
			HINGE PIN (DOOR)	112
			COLLAR (DOOR)	112

WATERTIGHT CLOSURE PARTS

FF1032 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)										HEX NUTS	LOCK NUTS	FLAT WSHRS	NYLON WSHRS	PYRO CLIP
	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3 1/2	6	9	1/2				
8/10	0	60	0	0	0	0	0	0	0	0	0	0	120	180	0
1/4	48	522	0	0	0	0	0	0	0	0	0	0	750	930	330
5/16	78	0	0	0	0	0	16	0	0	0	0	0	34	34	3
3/8	574	686	40	306	44	0	124	0	0	0	0	304	3160	3615	142
1/2	24	0	0	200	0	78	16	0	0	0	0	96	636	304	0
5/8	0	0	0	0	0	0	4	0	0	0	0	0	8	0	0
3/4	0	24	0	0	0	16	4	4	0	0	0	0	84	532	0
1	0	0	0	0	0	0	0	0	2	4	0	0	12	12	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)							HEX NUTS	FLAT WSHRS
	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4		
3/8	0	0	0	22	0	0	2	24	48
1/2	36	12	42	32	0	0	0	122	244
5/8	0	0	0	104	40	96	32	272	544
3/4	0	0	0	200	0	0	0	192	420

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)			DESCRIPTION	QUANTITY
	2	2 1/2	3		
1/2	0	0	0	HINGE PIN (RAISED HATCH)	16
5/8	40	0	0	WASHER (RAISED HATCH)	16
	0	96	4	COTTER PIN	172
				HINGE PIN (SCUTTLE)	28
				COLLAR (SCUTTLE)	28
				UPPER LINK PIN (SCUTTLE)	14
				LOWER LINK PIN (SCUTTLE)	14
				COLLAR (LINK PIN)	14
				HINGE PIN (FLUSH DECK HATCH)	8
				WASHER (FLUSH DECK HATCH)	20
				HINGE PIN (DOOR)	156
				COLLAR (DOOR)	156

WATERTIGHT CLOSURE PARTS

FF1040 SHIP CLASS
316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)							HEX NUTS	LOCK NUTS	FLAT WASHERS	NYLON WASHERS	PYRO CLIP
	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2					
1/8	0	176	0	0	0	0	0	176	0	284	392	68
1/4	224	536	16	0	0	0	0	896	0	1656	1432	136
5/16	56	320	64	0	0	0	16	384	0	520	520	320
3/8	448	500	0	208	44	194	136	1374	120	2768	3592	0
1/2	0	0	0	128	0	96	32	288	8	576	1840	0
5/8	0	0	0	0	0	0	4	4	0	8	104	0
3/4	0	0	0	0	0	36	0	0	0	36	548	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)					HEX NUTS	FLAT WASHERS
	1 1/4	1 1/2	1 3/4	2	2 1/2		
3/8	192	0	0	40	0	264	552
1/2	128	72	32	0	0	168	464
5/8	0	36	0	0	32	64	164
3/4	0	0	0	0	256	256	512

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)		DESCRIPTION	QUANTITY
	2	6		
1/2	72	0	HINGE PIN (RAISED HATCH)	4
5/8	0	456	WASHER (RAISED HATCH)	4
			COTTER PIN	88
			HINGE PIN (SCUTTLE)	8
			COLLAR (SCUTTLE)	8
			UPPER LINK PIN (SCUTTLE)	4
			LOWER LINK PIN (SCUTTLE)	4
			COLLAR (LINK PIN)	4
			HINGE PIN (FLUSH DECK HATCH)	4
			WASHER (FLUSH DECK HATCH)	4
			HINGE PIN (DOOR)	84
			COLLAR (DOOR)	84

WATERTIGHT CLOSURE PARTS

0062 SHIP CLASS

316 - SS FASTENERS

DIMETER

LENGTH (IN)

	3/4	1	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	4 1/2	6	6 1/2	9	1/2	HEX NUTS	LOCK NUTS	FLAT WSHRS	NYLON WSHRS	PYRO CLIP
Ø10	0	112	0	0	0	0	0	0	0	0	0	0	0	0	112	0	224	335	0
1/4	78	144	0	0	0	0	0	0	0	0	0	0	0	0	218	12	382	498	78
5/16	32	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	48	48	0
3/8	252	588	276	40	64	112	0	0	0	0	0	0	0	0	1084	196	2352	3470	168
1/2	0	0	168	0	36	0	0	0	0	0	0	0	0	0	96	112	488	818	0
5/8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	442	0
3/4	0	0	0	0	4	0	0	4	4	4	2	0	0	0	18	0	64	496	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	8	8	0

CERAMIC COATED FASTENERS

DIMETER
(IN)

LENGTH (IN)

	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	HEX NUTS	FLAT WSHRS
3/8	268	0	16	32	0	0	0	316	664
1/2	112	36	0	48	0	0	0	382	410
5/8	0	16	0	98	48	112	0	388	426
3/4	0	152	0	0	0	0	64	216	432

316 - SS TOGGLE PINS

DIMETER
(IN)

LENGTH (IN)

	2	6
1/2	200	0
5/8	0	300

WATERTIGHT CLOSURE PARTS

DESCRIPTION

QUANTITY

HINGE PIN (RAISED HATCH)	16
WASHER (RAISED HATCH)	16
COTTER PIN	148
HINGE PIN (SCUTTLE)	16
COLLAR (SCUTTLE)	16
UPPER LINK PIN (SCUTTLE)	0
LOWER LINK PIN (SCUTTLE)	0
COLLAR (LINK PIN)	0
HINGE PIN (DOOR)	132
COLLAR (DOOR)	132

DD363 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)										HEX NUTS	LOCK NUTS	FLAT WASHERS	NYLON WASHERS	PYRO CLIP
	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2					
410	112	0	1004	0	0	0	0	0	0	0	0	0	2200	2300	0
1/4	0	180	3874	0	0	0	0	0	0	0	0	24	7844	8656	234
5/16	0	246	1532	0	0	0	0	16	0	0	0	0	1784	1332	1474
3/8	0	856	1394	2830	648	144	264	172	0	0	0	364	8784	9610	352
1/2	0	48	24	0	608	0	124	72	0	0	0	360	1704	1920	0
5/8	0	0	0	0	0	0	0	16	0	0	24	24	80	240	0
3/4	0	0	40	0	0	0	0	0	2	2	0	0	88	500	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)										HEX NUTS	FLAT WASHERS
	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	5	6		
3/8	16	0	0	0	0	0	0	0	0	0	16	32
1/2	0	16	12	32	24	0	0	0	0	0	32	168
5/8	0	0	0	0	76	96	0	0	0	0	172	344
3/4	0	16	0	0	0	64	64	64	64	64	200	416

WATERTIGHT CLOSURE PARTS

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)		DESCRIPTION	QUANTITY
	1/2	3/4		
2 1/2	6	0	HINGE PIN (RAISED HATCH)	28
7/8	0	0	WASHER (RAISED HATCH)	28
0	216	0	COTTER PIN	232
			HINGE PIN (SCUTTLE)	0
			COLLAR (SCUTTLE)	0
			UPPER LINK PIN (SCUTTLE)	4
			LOWER LINK PIN (SCUTTLE)	4
			COLLAR (LINK PIN)	4
			HINGE PIN (DOOR)	204
			COLLAR (DOOR)	204

CGN38 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)							LOCK NUTS	FLAT WSHRS	NYLON WSHRS
	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4	5
#10	24	216	0	0	0	0	0	0	0	496
1/4	0	992	0	0	0	0	0	0	0	2316
5/16	240	0	0	0	0	144	32	0	0	416
3/8	1148	818	24	620	208	0	108	0	0	5000
1/2	0	0	0	152	0	164	0	0	0	848
5/8	0	0	0	0	0	52	0	0	0	576
3/4	0	0	0	12	0	0	0	44	0	172

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)					HEX NUTS	FLAT WSHRS
	1 1/4	1 3/4	2	2 1/2	3		
3/8	32	24	0	4	0	60	120
1/2	64	12	0	4	16	92	216
5/8	0	0	104	32	100	236	472
3/4	0	0	0	24	0	24	48

316 - SS TOSGLE PINJ

DIAMETER (IN)	LENGTH (IN)		DESCRIPTION	QUANTITY
	2	5		
1/2	384	0	HINGE PIN (RAISED HATCH)	36
5/8	0	0	WASHER (RAISED HATCH)	36
			COTTER PIN	168
			HINGE PIN (SCUTTLE)	100
			COLLAR (SCUTTLE)	100
			UPPER LINK PIN (SCUTTLE)	50
			LOWER LINK PIN (SCUTTLE)	50
			COLLAR (LINK PIN)	50
			HINGE PIN (FLUSH DECK HATCH)	20
			WASHER (FLUSH DECK HATCH)	76
			HINGE PIN (DOOR)	132
			COLLAR (DOOR)	132

ARS SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)						HEX NUTS	LOCK NUTS	FLAT WSHRS	NYLON WSHRS	PYRO CLIP
	3/4	1	1 1/2	1 3/4	2	2 1/2	4				
9/16	0	68	0	0	0	0	0	0	136	568	0
1/4	0	396	0	32	0	32	0	48	2264	240	240
5/16	0	202	0	0	0	0	0	0	210	362	202
3/8	392	698	644	140	60	68	0	336	3434	3926	286
1/2	0	0	124	0	102	12	0	300	0	500	0
5/8	0	0	0	0	24	0	0	24	48	48	0
3/4	0	0	0	0	0	0	12	0	24	48	0

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)						HEX NUTS	FLAT WSHRS
	1 1/4	1 1/2	1 3/4	2	2 1/2	3		
3/8	0	144	28	0	0	172	352	0
1/2	0	464	0	204	0	684	1232	0
5/8	0	48	0	36	16	52	152	0
3/4	0	48	0	0	0	0	48	0

WATERTIGHT CLOSURE PARTS

DESCRIPTION	QUANTITY
HINGE PIN (RAISED HATCH)	40
WASHER (RAISED HATCH)	40
COTTER PIN	400
HINGE PIN (SCUTTLE)	32
COLLAR (SCUTTLE)	32
UPPER LINK PIN (SCUTTLE)	16
LOWER LINK PIN (SCUTTLE)	16
COLLAR (LINK PIN)	16
HINGE PIN (DOOR)	360
COLLAR (DOOR)	360

CG16 SHIP CLASS

316 - SS FASTENERS

DIAMETER (IN)	LENGTH (IN)										PYRO CLIP
	3/4	1	1 3/4	2	2 1/2	3	3 1/2	4	1/2	6 1/2	
9/16	0	348	0	0	0	0	0	0	0	0	253
1/4	0	408	28	0	0	0	0	0	0	0	156
5/16	0	18	0	0	0	0	0	0	0	0	84
3/8	238	926	48	64	96	0	4	0	0	0	3476
1/2	0	0	0	20	0	0	0	0	0	0	648
5/8	0	0	0	32	8	24	0	0	0	0	648
3/4	0	0	4	0	24	8	4	4	0	0	432
1	0	0	0	0	0	0	0	0	0	0	8

CERAMIC COATED FASTENERS

DIAMETER (IN)	LENGTH (IN)										PYRO CLIP
	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	1/2	6 1/2	9 1/2	
3/8	84	328	0	0	0	0	404	744	0	0	253
1/2	0	96	0	16	0	0	132	224	0	0	156
5/8	0	0	36	16	208	0	268	528	0	0	84
3/4	0	0	64	0	0	128	128	256	0	0	3476

316 - SS TOGGLE PINS

DIAMETER (IN)	LENGTH (IN)										PYRO CLIP
	2	3	4	6	0	0	0	0	0	0	
1/2	32	0	0	0	0	0	0	0	0	0	253
5/8	0	0	0	48	0	0	0	0	0	0	156

WATERTIGHT CLOSURE PARTS

DIAMETER (IN)	LENGTH (IN)										PYRO CLIP
	2	3	4	6	0	0	0	0	0	0	
1/2	32	0	0	0	0	0	0	0	0	0	253
5/8	0	0	0	48	0	0	0	0	0	0	156

APPENDIX A6-2
DRAFT INSTALLATION-KIT BOOK
for
THE FF-1052 CLASS SHIP

1.0 INTRODUCTION

The collation of Installation-Kit Technical Data Sheets (TDS) by ship class give the SIMA planner a single document to utilize for reordering fasteners. Upon receipt of a CC AWR, the planner would order fasteners, sealants and gaskets to replace the PEB fasteners, sealants and gaskets given to the ship for reinstallation of preserved components.

The requirement for Installation-Kit books for each ship class would be eliminated with the development of Installation-Kit TDS for all ship classes and components. The Installation-Kit TDS would provide fastener information the planner would require to reorder fasteners to replenish the PEB.

2.0 DEVELOPMENT

The development of TDS's was initiated under the Pilot CC Service Test as a method for training the shop's designated Installation-Kit Petty Officer and to Ship's Forces to understand the correct method of reinstallation of processed components. This document also provides instructions for Ship's Force to properly reinstall processed components when repair/maintenance is required.

It is recommended that this computerized system be completed under separate contract for inventory control and proper installation of components processed through the Corrosion Control Shop.

TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BOX, ELEVATOR MC

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1 1/4	4	CER BOLT
F2	3/8	1 3/4	6	CER BOLT
F3	3/8		10	CER HEX NUT
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

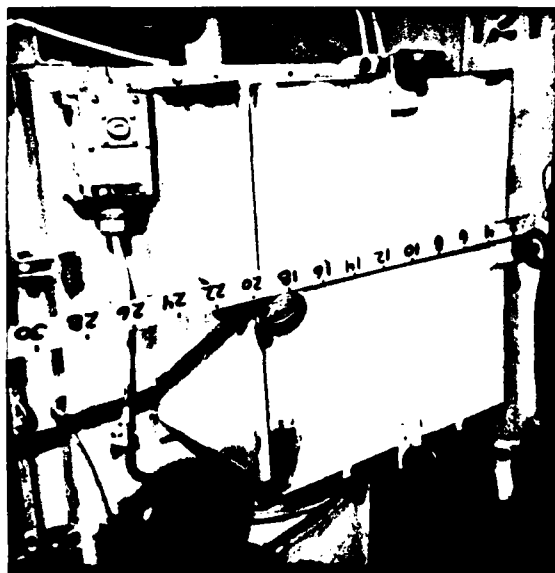
	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	20	CER	G1
W2	3/8	20	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

GASKETS

COMPONENT

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BOX, JP-5 CONTROL

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	2 1/2	10	316 BOLT
F2	1/2	2	4	316 BOLT
F3	3/8		10	316 LOCK NUT
F4	1/2		4	316 HEX NUT
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

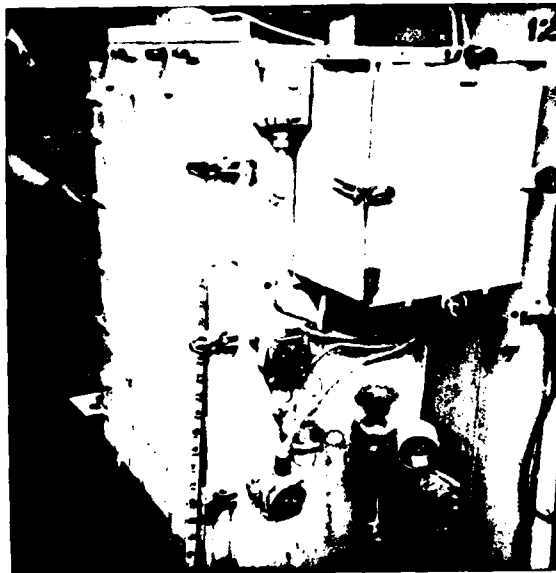
	DIAM	QTY	MAT'L
W1	3/8	20	316
W2	3/8	20	NYLON
W3	1/2	8	316
W4	1/2	8	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BOX, SIGNAL FLARE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1 1/4	8	316 BOLT
F2	3/8		8	316 HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	16	316	G1
W2	3/8	16	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

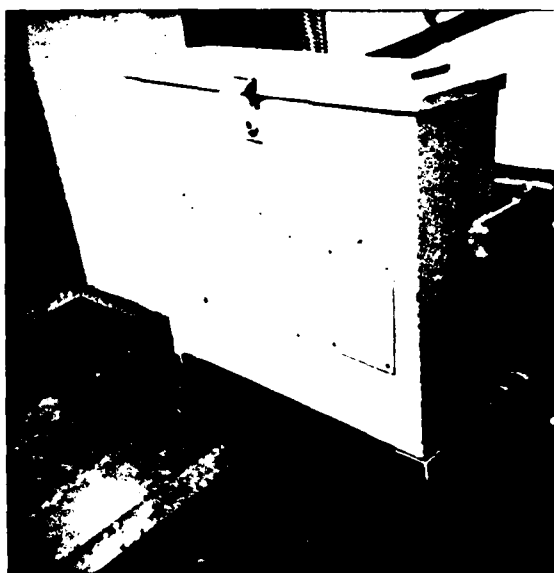
GASKETS

COMPONENT

	MATERIAL
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BOX, SP TELEPHONE HANDSET

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1	3	316 BOLT
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	3/8	3	316
W2	3/8	3	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	

COMPONENT

QUANTITY PER SHIP:

5



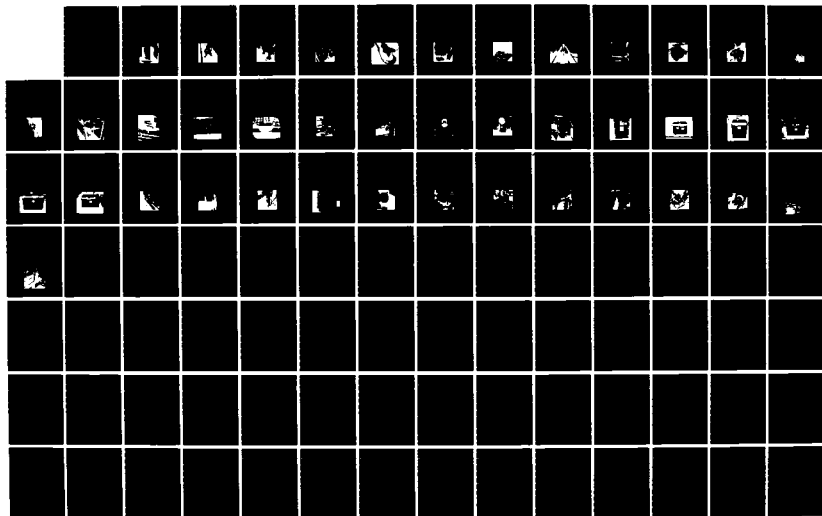
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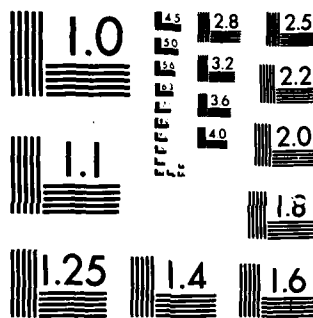
CORROSION-CONTROL (CC) PROGRAM SIMA (SHORE INTERMEDIATE 4/5
MAINTENANCE ACTIV. (U) INTEGRATED SYSTEMS ANALYSTS INC
NATIONAL CITY CA W ADKINS ET AL 30 NOV 85
ISAC(NC)-107-VOL-2 N66001-85-C-0350

UNCLASSIFIED

F/G 11/6

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BOX, SP TELEPHONE STOWAGE

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1	4	316 BOLT
F2	3/8		4	316 HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

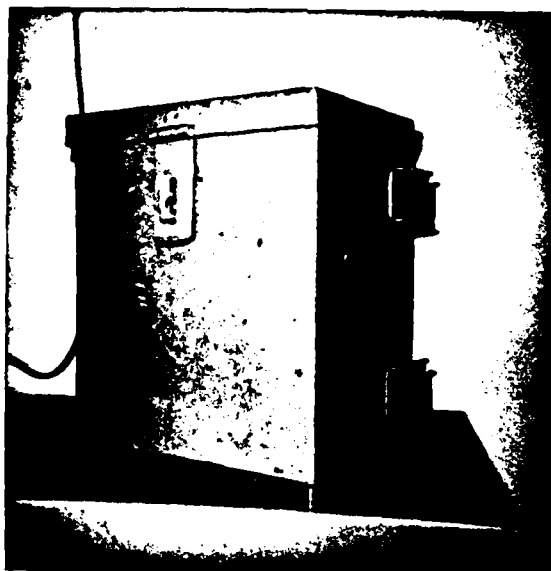
GASKETS

	DIAM	QTY	MAT'L		MATERIAL
W1	3/8	8	316	G1	
W2	3/8	8	NYLON	G2	
W3				G3	
W4					
W5					
W6					
W7				M1	ALUMINUM
W8				M2	ALUMINUM
W9				M3	
W10				M4	
				M5	

COMPONENT

QUANTITY PER SHIP:

9



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BRACKET, JACKSTAFF

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	2	1	316 BOLT
F2	3/4	1 1/2	2	316 BOLT
F3	1/2		1	316 HEX NUT
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

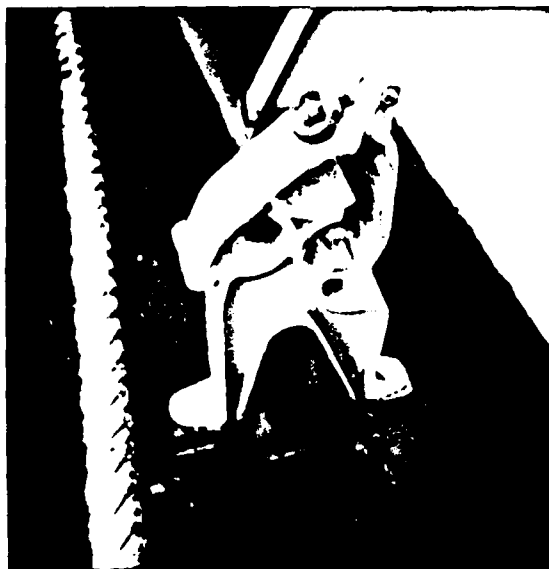
	DIAM	QTY	MAT'L
W1	1/2	2	316
W2	1/2	2	NYLON
W3	3/4	2	316
W4	3/4	2	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: BRAKE, ANCHOR WINDLASS

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/4	2	10	CER BOLT
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

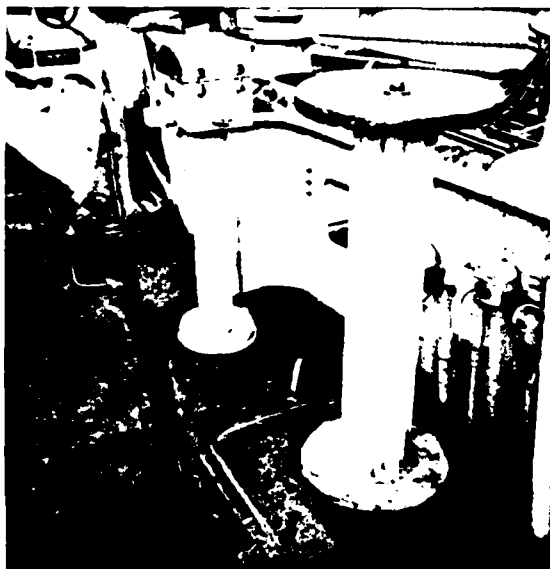
	DIAM	QTY	MAT'L
W1	3/4	10	CER
W2	3/4	10	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: CONTROLLER, CAPSTAN

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	5/16	2 1/2	4	316 BOLT
F2	3/4	2	4	316 BOLT
F3	1/2	7/8	4	316 PIN
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	5/16	4	316
W2	5/16	4	NYLON
W3	3/4	4	316
W4	3/4	4	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

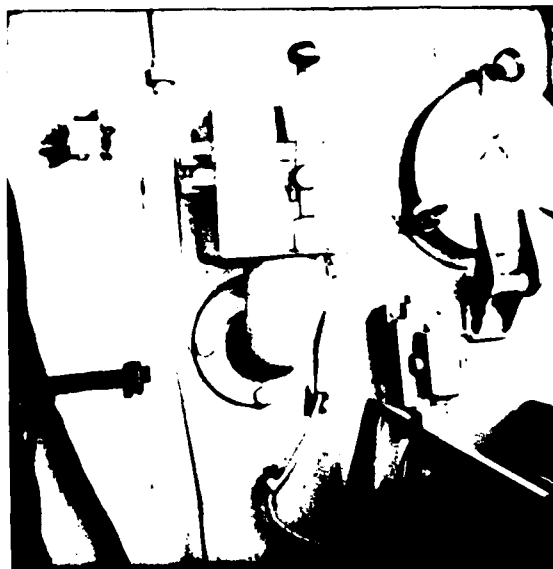
	MATERIAL
G1	
G2	
G3	

COMPONENT

	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: COVER, CHAIN LOCKER

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1 3/4	6	CER BOLT
F2	1/2		6	CER HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

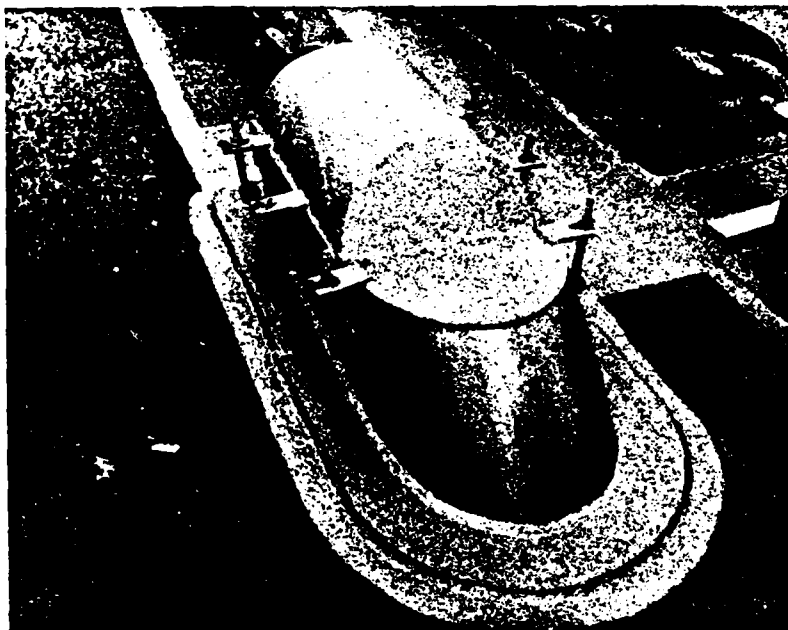
	DIAM	QTY	MAT'L
W1	1/2	12	CER
W2	1/2	12	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

3



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: COVER, VDS GUIDE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	2	11	CER BOLT
F2	3/8	4	1	CER BOLT
F3	5/8	2 1/2	4	CER BOLT
F4	3/8		12	CER HEX NUT
F5	5/8		4	CER HEX NUT
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	24	CER	G1
W2	3/8	24	NYLON	G2
W3	5/8	8	CER	G3
W4	5/8	8	NYLON	

GASKETS

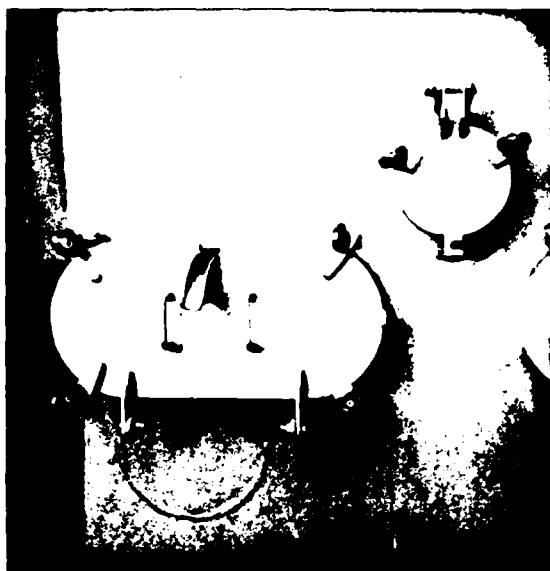
	DIAM	QTY	MAT'L	MATERIAL
W5				
W6				
W7				
W8				
W9				
W10				

COMPONENT

	MATERIAL
M1	STEEL
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: DOOR QA. WATERTIGHT

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1			2	HINGE PIN
F2			2	COLLAR
F3			2	COTTER PIN
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1			
W2			
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

27



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: FLAGSTAFF

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1	9 1/2	2	316 BOLT
F2	3/4	2 1/2	2	316 BOLT
F3	5/8	3	2	316 TOGGLE PIN
F4	1		2	316 HEX NUT
F5	3/4		2	316 HEX NUT
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

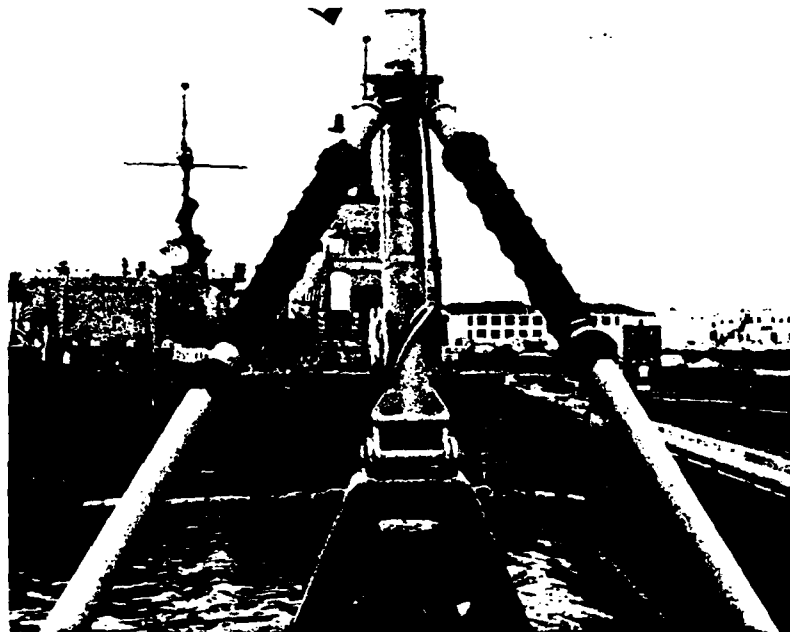
	DIAM	QTY	MAT'L
W1	3/4	4	316
W2	3/4	4	NYLON
W3	1	4	316
W4	1	4	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

1



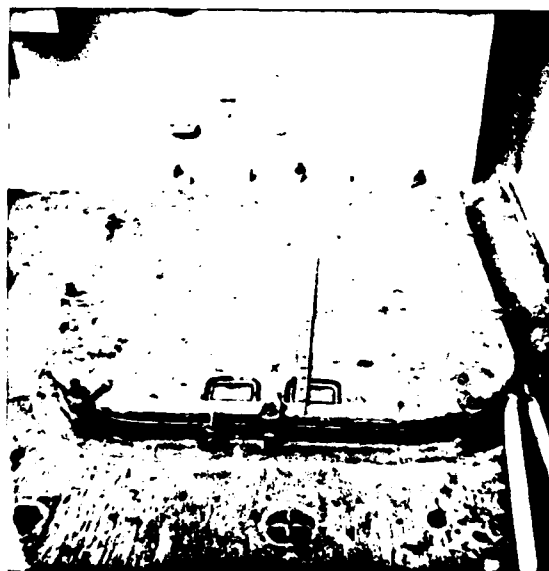
TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: HATCH, FLUSH DECK

FASTENERS					NAVSEA CC SYSTEMS																																																																							
	DIAM	LNTH	QTY	MATERIAL																																																																								
F1			2	HINGE PIN	1. WSA (HT)																																																																							
F2					2. WSA (LT)	X																																																																						
F3					3. TOPCOATS																																																																							
F4					4. POWDERED COATINGS																																																																							
F5					5. NON - SKID DECK COATINGS																																																																							
F6					6. CERAMIC COATINGS																																																																							
F7					7. WATER DISPLACING COMPOUND																																																																							
F8					8. ANTI - SEIZE COMPOUND	X																																																																						
F9					9. IMPROVED FASTENERS																																																																							
F10					10. SEALING & COATING COMPOUND																																																																							
<table border="1"> <thead> <tr> <th colspan="3">WASHERS</th> <th colspan="2">GASKETS</th> </tr> <tr> <th>DIAM</th> <th>QTY</th> <th>MAT'L</th> <th></th> <th>MATERIAL</th> </tr> </thead> <tbody> <tr> <td>W1</td> <td></td> <td></td> <td></td> <td>G1</td> <td></td> </tr> <tr> <td>W2</td> <td></td> <td></td> <td></td> <td>G2</td> <td></td> </tr> <tr> <td>W3</td> <td></td> <td></td> <td></td> <td>G3</td> <td></td> </tr> <tr> <td>W4</td> <td></td> <td></td> <td></td> <td colspan="2">COMPONENT</td> </tr> <tr> <td>W5</td> <td></td> <td></td> <td></td> <td></td> <td>MATERIAL</td> </tr> <tr> <td>W6</td> <td></td> <td></td> <td></td> <td>M1</td> <td>STEEL</td> </tr> <tr> <td>W7</td> <td></td> <td></td> <td></td> <td>M2</td> <td>STEEL</td> </tr> <tr> <td>W8</td> <td></td> <td></td> <td></td> <td>M3</td> <td></td> </tr> <tr> <td>W9</td> <td></td> <td></td> <td></td> <td>M4</td> <td></td> </tr> <tr> <td>W10</td> <td></td> <td></td> <td></td> <td>M5</td> <td></td> </tr> </tbody> </table>					WASHERS			GASKETS		DIAM	QTY	MAT'L		MATERIAL	W1				G1		W2				G2		W3				G3		W4				COMPONENT		W5					MATERIAL	W6				M1	STEEL	W7				M2	STEEL	W8				M3		W9				M4		W10				M5		11. POLYSULFIDE SEALANT	
					WASHERS			GASKETS																																																																				
DIAM	QTY	MAT'L		MATERIAL																																																																								
W1				G1																																																																								
W2				G2																																																																								
W3				G3																																																																								
W4				COMPONENT																																																																								
W5					MATERIAL																																																																							
W6				M1	STEEL																																																																							
W7				M2	STEEL																																																																							
W8				M3																																																																								
W9				M4																																																																								
W10				M5																																																																								
					12. PROTECTION OF ELEC. CONN.																																																																							
					13. DIELECTRIC BARRIER (ABS)																																																																							
					14. VAPOR PHASE INHIBITOR (VPI)																																																																							
					15. STRIPPABLE COATINGS																																																																							

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: HATCH, RAISED

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1			2	HINGE PIN
F2			2	WASHER
F3	1/8	1	2	COTTER PIN
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

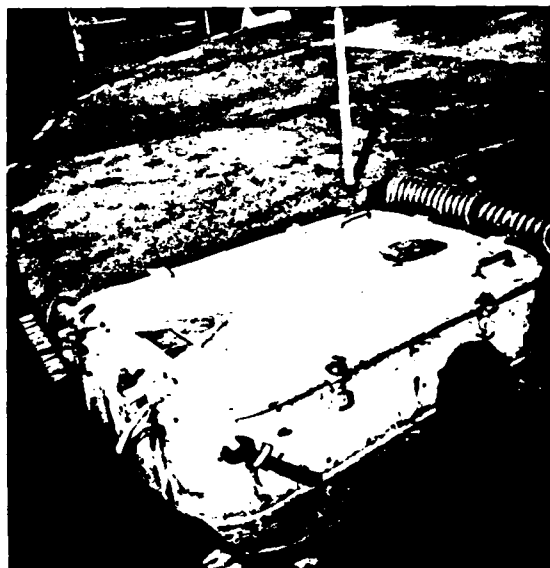
	DIAM	QTY	MAT'L
W1			
W2			
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: HATCH, RAISED W/SCUTTLE

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL
F1			2	HINGE PIN (HATCH)
F2			2	WASHER
F3	1/8	1	2	COTTER PIN
F4			2	HINGE PIN (SCUTTLE)
F5			2	COLLAR (SCUTTLE)
F6			1	LINK PIN (LOWER)
F7			1	LINK PIN (UPPER)
F8			1	COLLAR (LINK PIN)
F9				
F10				

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

GASKETS

	DIAM	QTY	MAT'L		MATERIAL
W1				G1	
W2				G2	
W3				G3	
W4					
W5					
W6					
W7				M1	STEEL
W8				M2	STEEL
W9				M3	
W10				M4	
				M5	

COMPONENT

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: JACKSTAFF

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL	
F1	5/8	2 1/2	2	316	BOLT
F2	3/4	3 1/2	2	316	BOLT
F3	1	6	1	316	BOLT
F4	5/8		2	316	HEX NUT
F5	3/4		2	316	HEX NUT
F6	1		1	316	HEX NUT
F7					
F8					
F9					
F10					

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

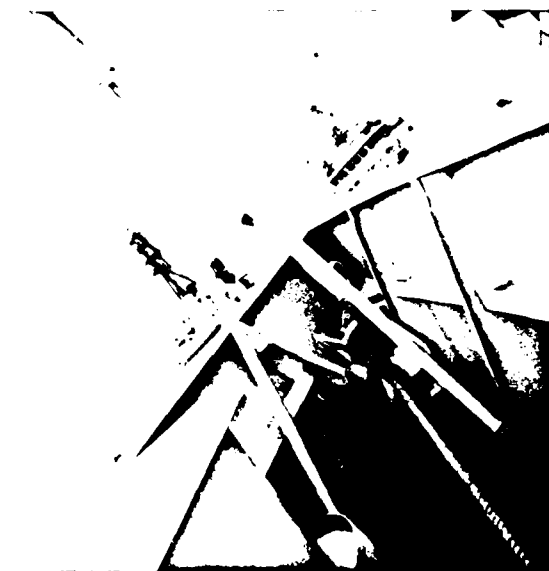
WASHERS

GASKETS

	DIAM	QTY	MAT'L		MATERIAL
W1	5/8	4	316	G1	
W2	5/8	4	NYLON	G2	
W3	3/4	4	316	G3	
W4	3/4	4	NYLON	COMPONENT	
W5	1	2	316		
W6	1	2	NYLON		MATERIAL
W7				M1	ALUMINUM
W8				M2	STEEL
W9				M3	
W10				M4	
				M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, DECK

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	3/4	7	316 BOLT
F2	3/8	1	3	316 BOLT
F3	3/8		10	316 HEX NUT
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	3/8	16	316
W2	3/8	16	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

MATERIAL

G1

G2

G3

COMPONENT

MATERIAL

M1 ALUMINUM

M2 ALUMINUM

M3

M4

M5

QUANTITY PER SHIP:

41



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, FLOOD LARGE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/4	1	4	316 BOLT
F2	3/8	2 1/2	2	316 BOLT
F3	3/8	1	4	316 BOLT
F4	1/4		4	316 HEX NUT
F5	3/8		6	316 HEX NUT
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NDN - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	1/4	8	316
W2	1/4	12	NYLON
W3	3/8	12	316
W4	3/8	18	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

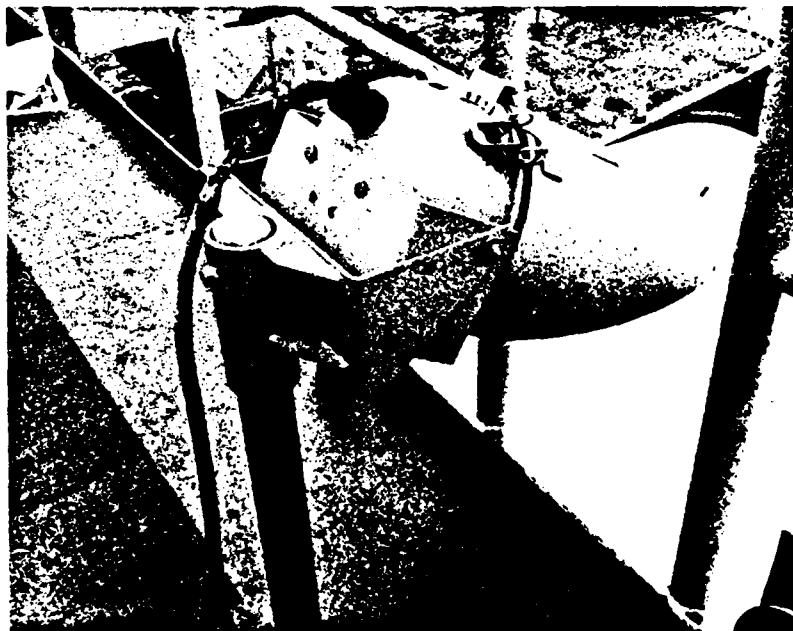
GASKETS

	MATERIAL
G1	
G2	
G3	

COMPONENT

QUANTITY PER SHIP:

7



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, FLOOD SMALL

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	#10	1	2	316 RND HD SCREW
F2	3/8	1	4	316 BOLT
F3	3/8	2 1/2	2	316 BOLT
F4	#10		2	316 HEX NUT
F5	3/8		6	316 HEX NUT
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	#10	4	316
W2	#10	6	NYLON
W3	3/8	12	316
W4	3/8	18	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

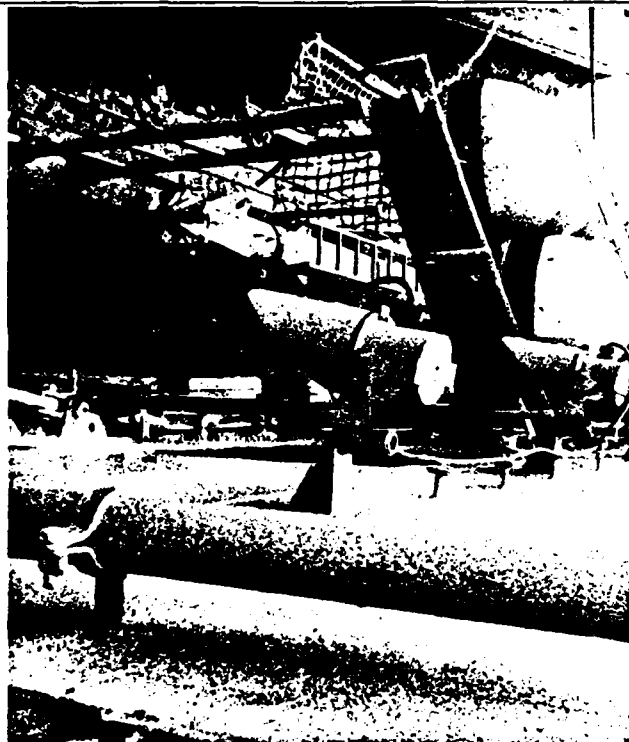
	MATERIAL
G1	
G2	
G3	

COMPONENT

	MATERIAL
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

15



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, HELD DECK EDGE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	5/16	3/4	3	316 BOLT
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

WASHERS

	DIAM	QTY	MAT'L
W1	5/16	3	316
W2	5/16	3	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

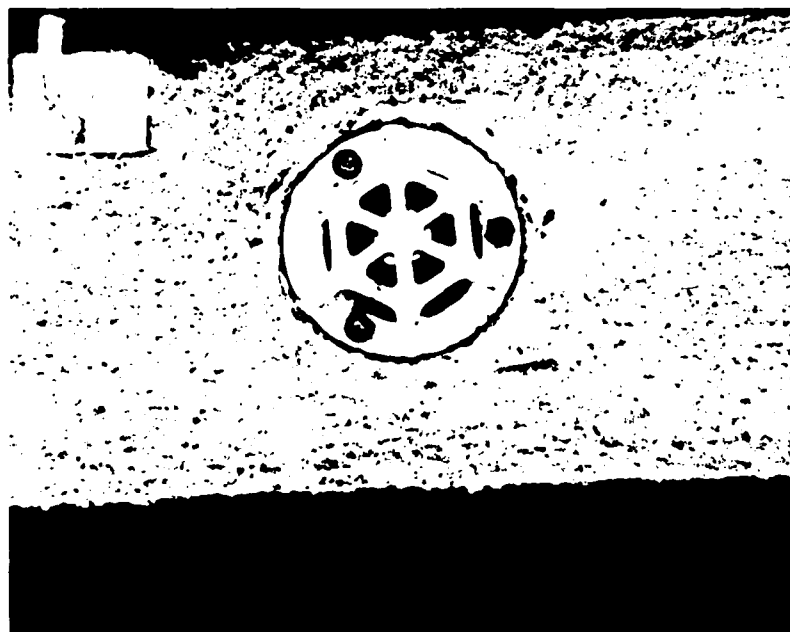
	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	STEEL
M3	
M4	
M5	

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

QUANTITY PER SHIP:

13



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, HELD SURFACE FLOOD

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/4	3/4	4	316 BOLT
F2	1/2	3/4	2	316 BOLT
F3	3/4	1	2	316 BOLT
F4	1/4		4	316 HEX NUT
F5	3/4		2	316 HEX NUT
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

GASKETS

	DIAM	QTY	MAT'L	MATERIAL
W1	1/4	8	316	G1
W2	1/4	12	NYLON	G2
W3	1/2	4	316	G3
W4	1/2	6	NYLON	
W5	3/4	4		
W6	3/4	4		
W7				
W8				
W9				
W10				

COMPONENT

	MATERIAL
M1	ALUMINUM
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

6



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, SIGNAL YOKE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1	2	CER BOLT
F2	5/8	4	4	CER BOLT
F3	5/8		4	CER HEX NUT
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	1/2	2	CER
W2	1/2	4	NYLON
W3	5/8	8	CER
W4	5/8	8	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

MATERIAL

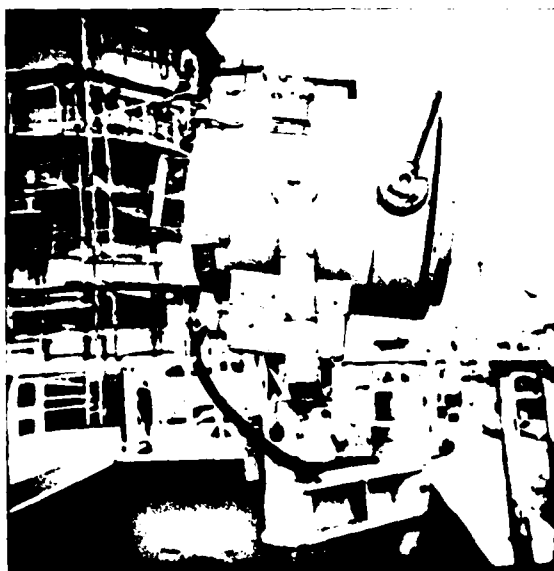
G1	
G2	
G3	

COMPONENT

	MATERIAL
M1	STEEL
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

4



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, STERN

FASTENERS					NAVSEA CC SYSTEMS	
	DIAM	LNTH	QTY	MATERIAL		
F1	1/4	1	3	316	BOLT	
F2	3/8	1 3/4	4	316	BOLT	
F3	1/4		3	316	HEX NUT	
F4	3/8		4	316	HEX NUT	
F5						
F6						
F7						
F8						
F9						
F10						
WASHERS			GASKETS			
	DIAM	QTY	MAT'L	MATERIAL		
W1	1/4	6	316	G1		
W2	1/4	9	NYLON	G2		
W3	3/8	8	316	G3		
W4	3/8	12	NYLON	COMPONENT		
W5					MATERIAL	
W6				M1	ALUMINUM	
W7				M2	STEEL	
W8				M3		
W9				M4		
W10				M5		
QUANTITY PER SHIP:						
2						

QUANTITY PER SHIP:

2

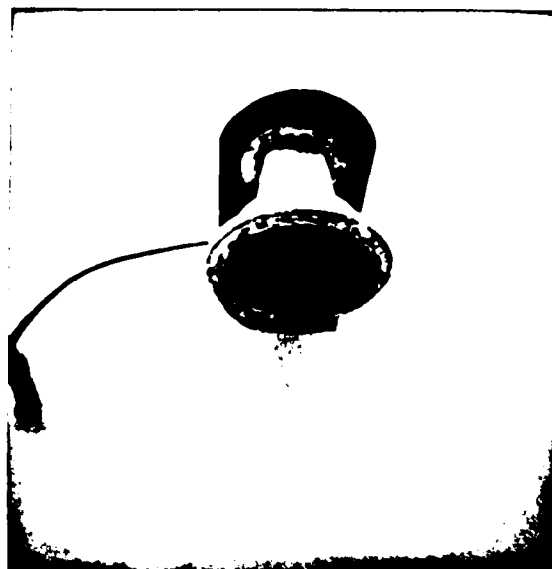


TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, UNREP

FASTENERS					NAVSEA CC SYSTEMS				
	DIAM	LNTH	QTY	MATERIAL					
F1	1/4	1	8	316	BOLT	1. WSA (HT)			
F2	1/4		8	316	HEX NUT	2. WSA (LT)			
F3						3. TOPCOATS			
F4						4. POWDERED COATINGS	X		
F5						5. NON - SKID DECK COATINGS			
F6						6. CERAMIC COATINGS			
F7						7. WATER DISPLACING COMPOUND			
F8						8. ANTI - SEIZE COMPOUND	X		
F9						9. IMPROVED FASTENERS	X		
F10						10. SEALING & COATING COMPOUND			
WASHERS					GASKETS			11. POLYSULFIDE SEALANT	X
								12. PROTECTION OF ELEC. CONN.	
								13. DIELECTRIC BARRIER (ABS)	
								14. VAPOR PHASE INHIBITOR (VPI)	
	DIAM	QTY	MAT'L		MATERIAL	15. STRIPPABLE COATINGS			
W1	1/4	16	316	G1		QUANTITY PER SHIP:			
W2	1/4	24	NYLON	G2					
W3				G3					
W4									
W5									
W6					MATERIAL				
W7				M1	ALUMINUM				
W8				M2	STEEL				
W9				M3					
W10				M4					
				M5					

4



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LIGHT, WATERLINE SECURITY

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1 1/2	4	316 BOLT
F2	3/8	1 3/4	2	316 BOLT
F3	1/2	2	1	316 BOLT
F4	3/8		6	316 HEX NUT
F5	1/2		2	316 HEX NUT
F6				
F7				
F8				
F9				
F10				

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

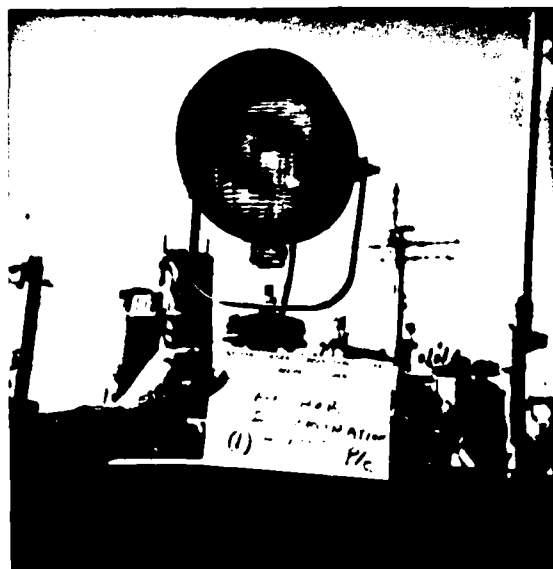
GASKETS

	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	12	316	G1
W2	3/8	14	NYLON	G2
W3	1/2	2	316	G3
W4	1/2	2	NYLON	
W5				
W6				
W7				
W8				
W9				
W10				

COMPONENT

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, AMMO

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1 1/2	10	CER BOLT
F2	1/2		10	CER HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	1/2	20	CER	G1
W2	1/2	20	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

GASKETS

COMPONENT

	MATERIAL
M1	STEEL
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, CHAFF CARTRIDGE

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1 1/2	24	CER BOLT
F2	1/2		24	CER HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

GASKETS

	DIAM	QTY	MAT'L		MATERIAL
W1	1/2	48	CER	G1	
W2	1/2	48	NYLON	G2	
W3				G3	
W4					
W5					
W6					
W7				M1	STEEL
W8				M2	ALUMINUM
W9				M3	
W10				M4	
				M5	

COMPONENT

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, PYRO

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1	41	316 BOLT
F2	3/8	2 1/2	8	316 BOLT
F3	1/2	1 1/2	24	CER BOLT
F4	3/8		8	316 HEX NUT
F5	3/8		41	316 CLIP
F6	1/2		24	CER HEX NUT
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

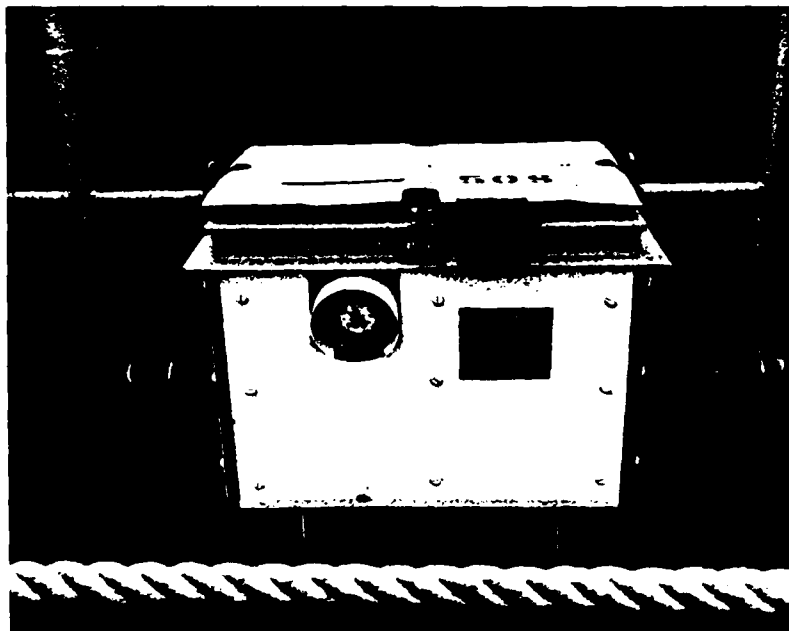
	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	57	316	G1
W2	3/8	57	NYLON	G2
W3	1/2	48	CER	G3
W4	1/2	48	NYLON	
W5				
W6				M1 ALUMINUM
W7				M2 ALUMINUM
W8				M3
W9				M4
W10				M5

GASKETS

COMPONENT

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, PYRO 25 X 20 X 29

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1	30	316 BOLT
F2	3/8	2 1/2	4	316 BOLT
F3	1/2	1 1/2	10	CER BOLT
F4	3/8		4	316 HEX NUT
F5	3/8		30	316 CLIP
F6	1/2		10	CER HEX NUT
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1. WSA (HT)
2. WSA (LT)
3. TOPCOATS
4. POWDERED COATINGS X
5. NON - SKID DECK COATINGS
6. CERAMIC COATINGS X
7. WATER DISPLACING COMPOUND
8. ANTI - SEIZE COMPOUND X
9. IMPROVED FASTENERS X
10. SEALING & COATING COMPOUND
11. POLYSULFIDE SEALANT X
12. PROTECTION OF ELEC. CONN.
13. DIELECTRIC BARRIER (ABS)
14. VAPOR PHASE INHIBITOR (VPI)
15. STRIPPABLE COATINGS

WASHERS

	DIAM	QTY	MAT'L
W1	3/8	34	316
W2	3/8	34	NYLON
W3	1/2	20	CER
W4	1/2	20	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

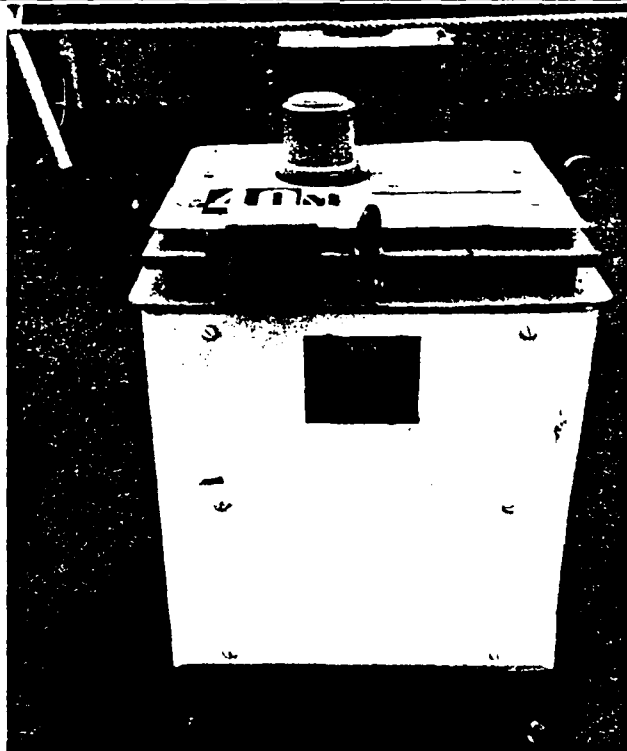
GASKETS

	MATERIAL
G1	
G2	
G3	

COMPONENT

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, PYRO 40 X 33 X 26

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/4	1	39	316 BOLT
F2	3/8	1/2	8	316 BOLT
F3	1/2	2	6	CER BOLT
F4	1/4		39	316 CLIP
F5	3/8		8	316 HEX NUT
F6	1/2		6	CER HEX NUT
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

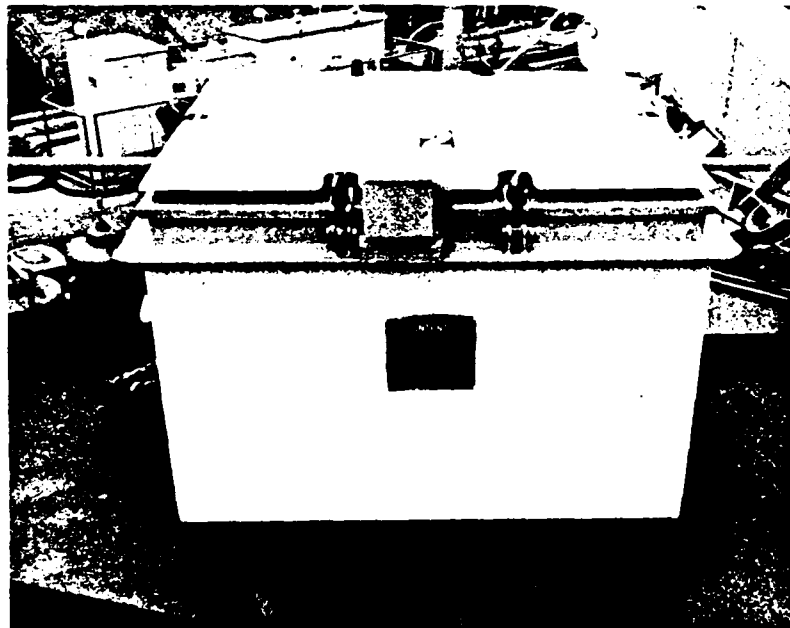
	DIAM	QTY	MAT'L
W1	1/4	39	316
W2	1/4	39	NYLON
W3	3/8	16	316
W4	3/8	16	NYLON
W5	1/2	12	CER
W6	1/2	12	NYLON
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

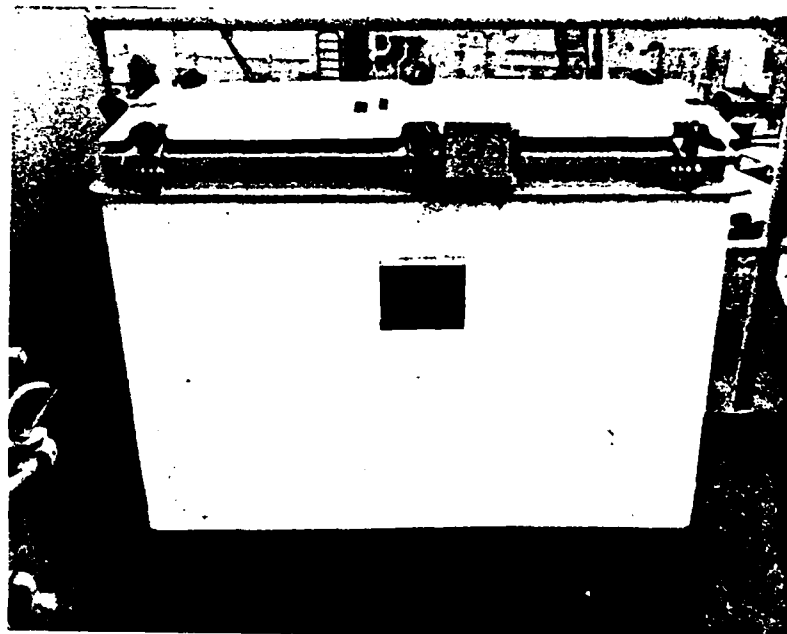
2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, PYRO 45 X 17 X 33

FASTENERS					NAVSEA CC SYSTEMS									
	DIAM	LNTH	QTY	MATERIAL										
F1	1/4	1	39	316	BOLT	1.	WSA (HT)							
F2	3/8	1 1/2	15	316	BOLT	2.	WSA (LT)							
F3	1/2	2	8	CER	BOLT	3.	TOPCOATS							
F4	1/4		39	316	CLIP	4.	POWDERED COATINGS	X						
F5	3/8		15	316	HEX NUT	5.	NON - SKID DECK COATINGS							
F6	1/2		8	CER	HEX NUT	6.	CERAMIC COATINGS	X						
F7						7.	WATER DISPLACING COMPOUND							
F8						8.	ANTI - SEIZE COMPOUND	X						
F9						9.	IMPROVED FASTENERS	X						
F10						10.	SEALING & COATING COMPOUND							
WASHERS					GASKETS					11.	POLYSULFIDE SEALANT	X		
										12.	PROTECTION OF ELEC. CONN.			
	DIAM		QTY	MAT'L	MATERIAL	13.	DIELECTRIC BARRIER (ABS)							
W1	1/4		39	316	G1	14.	VAPOR PHASE INHIBITOR (VPI)							
W2	1/4		39	NYLON	G2	15.	STRIPPABLE COATINGS							
W3	3/8		30	316	G3	QUANTITY PER SHIP:								
W4	3/8		30	NYLON										
W5	1/2		16	CER										
W6	1/2		16	NYLON										
W7					M1						ALUMINUM			
W8					M2						ALUMINUM			
W9					M3									
W10					M4									
					M5									



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: LOCKER, PYRD 45 X 33 X 27

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/4	1	39	316 BOLT
F2	3/8	1 1/2	8	316 BOLT
F3	1/2	2	6	CER BOLT
F4	1/4		39	316 CLIP
F5	3/8		8	316 HEX NUT
F6	1/2		6	CER HEX NUT
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

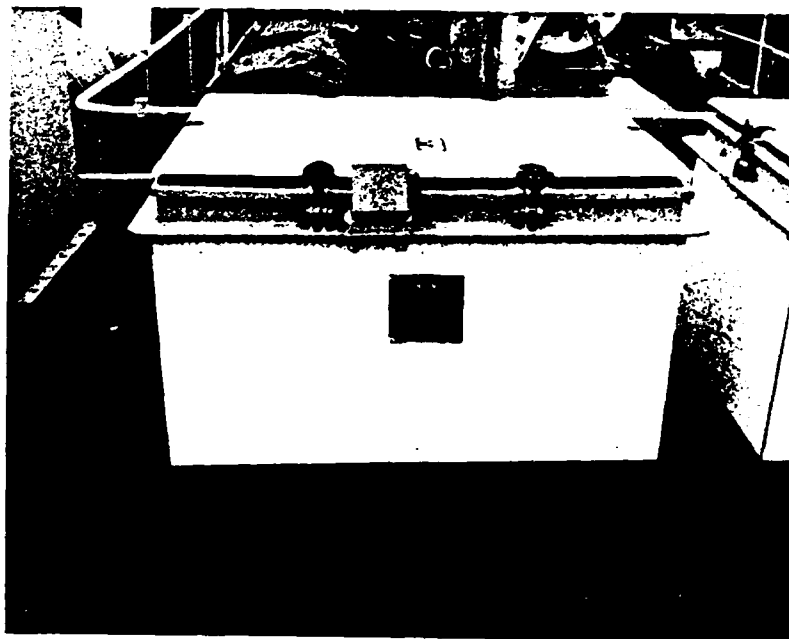
	DIAM	QTY	MAT'L
W1	1/4	39	316
W2	1/4	39	NYLON
W3	3/8	16	316
W4	3/8	16	NYLON
W5	1/2	12	CER
W6	1/2	12	NYLON
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: MOUNT, 50 CALIBER

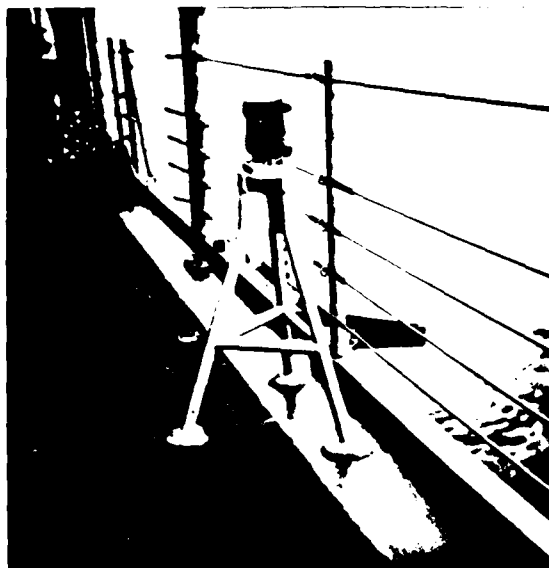
FASTENERS					NAVSEA CC SYSTEMS	
	DIAM	LNTH	QTY	MATERIAL		
F1	5/8	2	9	CER	BOLT	X
F2	5/8	2 1/2	4	CER	BOLT	
F3	5/8		13	CER	HEX NUT	
F4						
F5						
F6						
F7						
F8						
F9						
F10						
WASHERS			GASKETS			
	DIAM	QTY	MAT'L	MATERIAL		
W1	5/8	26		G1		
W2	5/8	26		G2		
W3				G3		
W4				COMPONENT		
W5						
W6						
W7						
W8						
W9						
W10						
				MATERIAL		
				M1 STEEL		
				M2 ALUM/STEEL		
				M3		
				M4		
				M5		

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

QUANTITY PER SHIP:

4

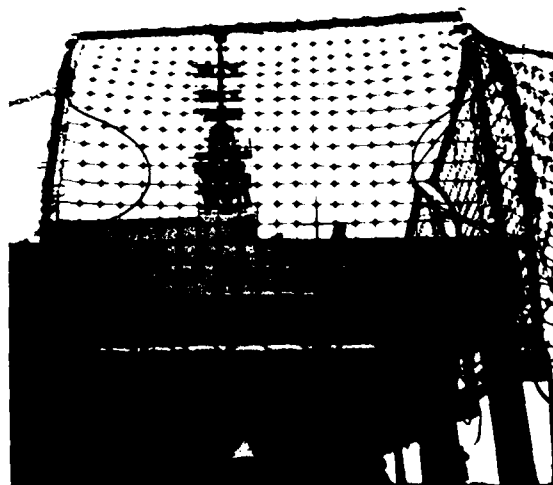
4



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: NET, HELD FRAME

FASTENERS					NAVSEA CC SYSTEMS			
	DIAM	LNTH	QTY	MATERIAL				
F1	5/8	2 1/2	2	316	TOGGLE PIN			
F2	5/8	3	2	CER	BOLT	X		
F3	3/4	2 1/2	4	CER	BOLT			
F4	5/8		2	CER	HEX NUT			
F5	3/4		4	CER	HEX NUT			
F6								
F7								
F8								
F9								
F10								
WASHERS				GASKETS				
	DIAM	QTY	MAT'L	MATERIAL				
W1	5/8	4	CER	G1				
W2	5/8	4	NYLON	G2				
W3	3/4	8	CER	G3				
W4	3/4	8	NYLON	COMPONENT				
W5								
W6							M1	STEEL
W7							M2	ALUMINUM
W8							M3	
W9							M4	
W10							M5	
						1. WSA (HT)		
						2. WSA (LT)	X	
						3. TOPCOATS		
						4. POWDERED COATINGS		
						5. NON - SKID DECK COATINGS		
						6. CERAMIC COATINGS	X	
						7. WATER DISPLACING COMPOUND		
						8. ANTI - SEIZE COMPOUND	X	
						9. IMPROVED FASTENERS	X	
						10. SEALING & COATING COMPOUND		
						11. POLYSULFIDE SEALANT	X	
						12. PROTECTION OF ELEC. CONN.		
						13. DIELECTRIC BARRIER (ABS)		
						14. VAPOR PHASE INHIBITOR (VPI)		
						15. STRIPPABLE COATINGS		
						QUANTITY PER SHIP:		
						24		



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: PEDESTAL, BINOCULAR

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1 1/2	4	316 BOLT
F2	1/2		4	316 HEX NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L
W1	1/2	8	316
W2	1/2	8	NYLON
W3			
W4			
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
	MATERIAL
M1	ALUMINUM
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

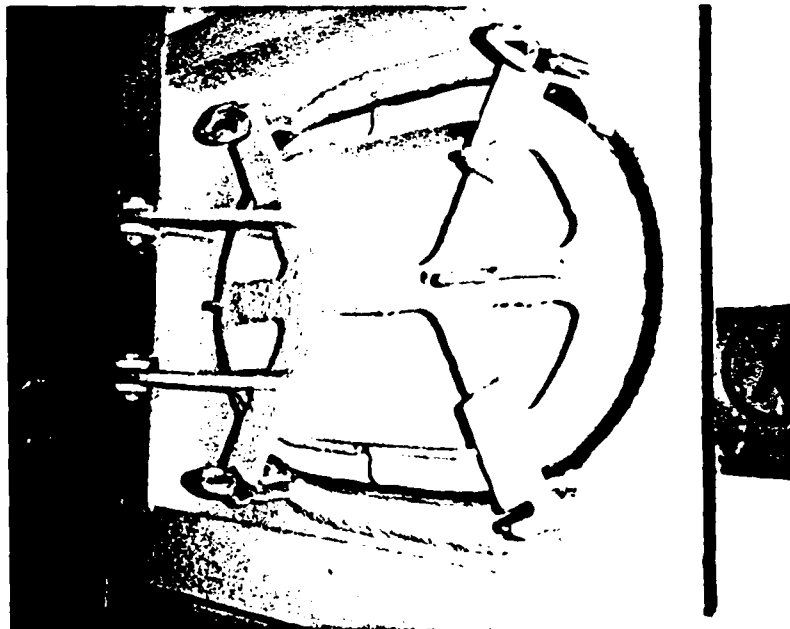
SHIP CLASS: FF1052 COMPONENT: PORT, SIGHT

FASTENERS					NAVSEA CC SYSTEMS	
	DIAM	LNTH	QTY	MATERIAL		
F1	1/2	2 1/2	2	316	BOLT	
F2	1/2		2	316	HEX NUT	
F3						
F4						
F5						
F6						
F7						
F8						
F9						
F10						
WASHERS			GASKETS			
	DIAM	QTY	MAT'L	MATERIAL		
W1	1/2	4	316	G1		
W2	1/2	4	NYLON	G2		
W3				G3		
W4				COMPONENT		
W5						
W6				MATERIAL		
W7				M1	ALUMINUM	
W8				M2	ALUMINUM	
W9				M3		
W10				M4		
				M5		

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

QUANTITY PER SHIP:

4



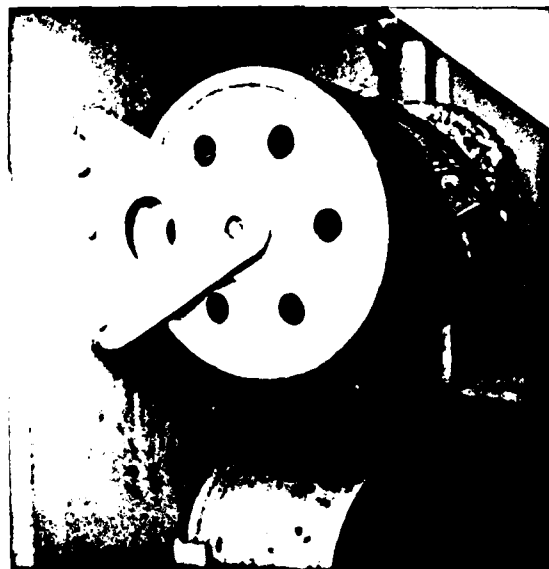
TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: REEL, DISTANCE LINE

FASTENERS					NAVSEA CC SYSTEMS																																																																													
	DIAM	LNTH	QTY	MATERIAL	1. WSA (HT)																																																																													
F1	1/2	1 1/2	6	CER BOLT	2. WSA (LT)	X																																																																												
F2	1/2		6	CER HEX NUT	3. TOPCOATS																																																																													
F3					4. POWDERED COATINGS																																																																													
F4					5. NON - SKID DECK COATINGS																																																																													
F5					6. CERAMIC COATINGS	X																																																																												
F6					7. WATER DISPLACING COMPOUND																																																																													
F7					8. ANTI - SEIZE COMPOUND	X																																																																												
F8					9. IMPROVED FASTENERS																																																																													
F9					10. SEALING & COATING COMPOUND																																																																													
F10					11. POLYSULFIDE SEALANT	X																																																																												
<table border="1"> <thead> <tr> <th colspan="3">WASHERS</th> <th colspan="2">GASKETS</th> </tr> <tr> <th>DIAM</th> <th>QTY</th> <th>MAT'L</th> <th></th> <th>MATERIAL</th> </tr> </thead> <tbody> <tr> <td>W1</td> <td>1/2</td> <td>12</td> <td>CER</td> <td>G1</td> <td></td> </tr> <tr> <td>W2</td> <td>1/2</td> <td>12</td> <td>NYLON</td> <td>G2</td> <td></td> </tr> <tr> <td>W3</td> <td></td> <td></td> <td></td> <td>G3</td> <td></td> </tr> <tr> <td>W4</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5">COMPONENT</td> <td></td> </tr> <tr> <td colspan="5"></td> <td>MATERIAL</td> </tr> <tr> <td>W6</td> <td></td> <td></td> <td></td> <td>M1</td> <td>STEEL</td> </tr> <tr> <td>W7</td> <td></td> <td></td> <td></td> <td>M2</td> <td>ALUMINUM</td> </tr> <tr> <td>W8</td> <td></td> <td></td> <td></td> <td>M3</td> <td></td> </tr> <tr> <td>W9</td> <td></td> <td></td> <td></td> <td>M4</td> <td></td> </tr> <tr> <td>W10</td> <td></td> <td></td> <td></td> <td>M5</td> <td></td> </tr> </tbody> </table>					WASHERS			GASKETS		DIAM	QTY	MAT'L		MATERIAL	W1	1/2	12	CER	G1		W2	1/2	12	NYLON	G2		W3				G3		W4						COMPONENT											MATERIAL	W6				M1	STEEL	W7				M2	ALUMINUM	W8				M3		W9				M4		W10				M5		12. PROTECTION OF ELEC. CONN.	
					WASHERS			GASKETS																																																																										
DIAM	QTY	MAT'L		MATERIAL																																																																														
W1	1/2	12	CER	G1																																																																														
W2	1/2	12	NYLON	G2																																																																														
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					14. VAPOR PHASE INHIBITOR (VPI)																																																																													
					15. STRIPPABLE COATINGS																																																																													

QUANTITY PER SHIP:

1



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: REEL, MOORING LINE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	2	8	CER BOLT
F2	5/8	2	8	CER BOLT
F3	1/2		8	CER HEX NUT
F4	1/2		8	CER HEX NUT
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

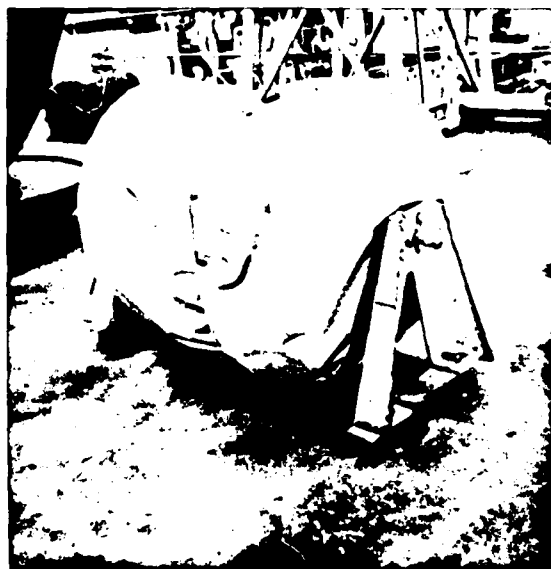
	DIAM	QTY	MAT'L
W1	1/2	16	CER
W2	1/2	16	NYLON
W3	5/8	16	CER
W4	5/8	16	NYLON
W5			
W6			
W7			
W8			
W9			
W10			

GASKETS

	MATERIAL
G1	
G2	
G3	
COMPONENT	
MATERIAL	
M1	STEEL
M2	ALUMINUM
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: REEL, SHORE POWER CABLE

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	1 1/4	6	CER BOLT
F2	1/2	1 3/4	1	CER BOLT
F3	1/2		7	CER HEX NUT
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	1/2	14	CER	G1
W2	1/2	14	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

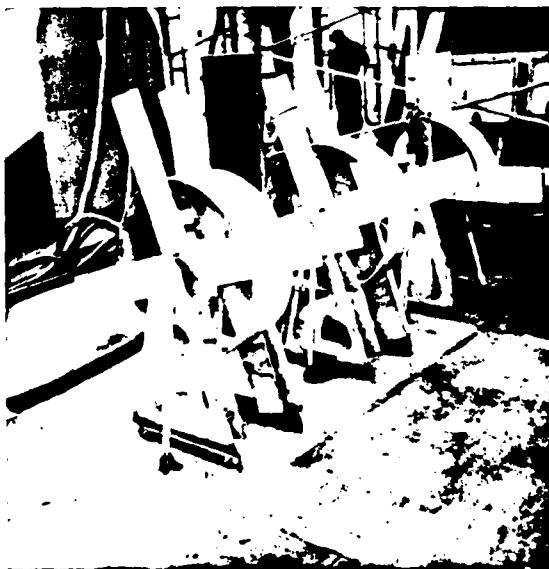
GASKETS

COMPONENT

MATERIAL
M1 STEEL
M2 ALUMINUM
M3
M4
M5

QUANTITY PER SHIP:

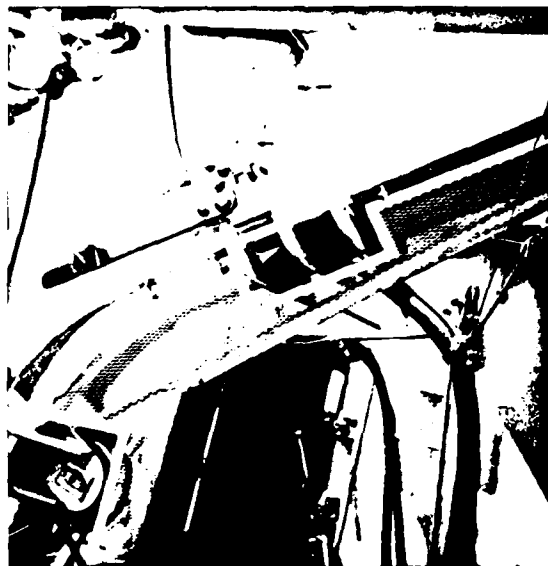
3



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: SCREEN, BOAT DAVIT

FASTENERS					NAVSEA CC SYSTEMS	
	DIAM	LNTH	QTY	MATERIAL		
F1	3/8	1 1/2	24	316 BOLT		
F2	3/8		24	316 LOCK NUT		
F3						
F4						
F5						
F6						
F7						
F8						
F9						
F10						
WASHERS					GASKETS	
	DIAM	QTY	MAT'L	MATERIAL		
W1	3/8	48	316	G1		
W2	3/8	48	NYLON	G2		
W3				G3		
W4						
W5						
W6						
W7						
W8						
W9						
W10						
					COMPONENT	
					MATERIAL	
					M1 STEEL	
					M2 STEEL	
					M3	
					M4	
					M5	
					QUANTITY PER SHIP:	
					2	



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: SCUTTLE, FLUSH DECK

FASTENERS

NAVSEA CC SYSTEMS

	DIAM	LNTH	QTY	MATERIAL
F1			2	HINGE PIN
F2			2	COLLAR (HINGE PIN)
F3			1	LINK PIN (LOWER)
F4			1	LINK PIN (UPPER)
F5			2	WASHER
F6				
F7				
F8				
F9				
F10				

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

GASKETS

	DIAM	QTY	MAT'L		MATERIAL
W1				G1	
W2				G2	
W3				G3	
W4					
W5					
W6					
W7				M1	STEEL
W8				M2	STEEL
W9				M3	
W10				M4	
				M5	

COMPONENT

QUANTITY PER SHIP:

5



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: SOCKET, PORTABLE DAVIT

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	1/2	6	1	316 TOGGLE PIN
F2	3/4	2 1/2	4	CER BOLT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	X
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	3/4	4	CER	G1
W2	3/4	4	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

GASKETS

COMPONENT

	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

2



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: SPEAKER, 1 MC

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	3/8	1 1/2	6	316 BOLT
F2	3/8		6	316 LOCK NUT
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	
3.	TOPCOATS	
4.	POWDERED COATINGS	X
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	X
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1	3/8	12	316	G1
W2	3/8	15	NYLON	G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

GASKETS

COMPONENT

MATERIAL

M1 ALUMINUM

M2 ALUMINUM

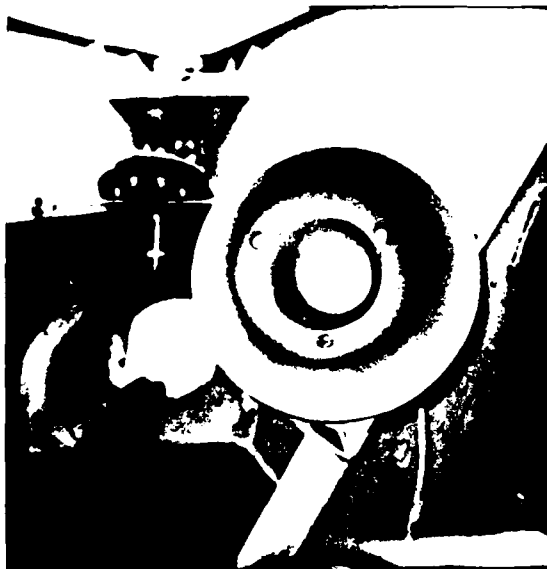
M3

M4

M5

QUANTITY PER SHIP:

15



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: STANCHION

FASTENERS

	DIAM	LNTH	QTY	MATERIAL
F1	5/8	6	3	316 TOGGLE PIN
F2				
F3				
F4				
F5				
F6				
F7				
F8				
F9				
F10				

NAVSEA CC SYSTEMS

1.	WSA (HT)	
2.	WSA (LT)	X
3.	TOPCOATS	
4.	POWDERED COATINGS	
5.	NON - SKID DECK COATINGS	
6.	CERAMIC COATINGS	
7.	WATER DISPLACING COMPOUND	
8.	ANTI - SEIZE COMPOUND	
9.	IMPROVED FASTENERS	X
10.	SEALING & COATING COMPOUND	
11.	POLYSULFIDE SEALANT	X
12.	PROTECTION OF ELEC. CONN.	
13.	DIELECTRIC BARRIER (ABS)	
14.	VAPOR PHASE INHIBITOR (VPI)	
15.	STRIPPABLE COATINGS	

WASHERS

	DIAM	QTY	MAT'L	MATERIAL
W1				G1
W2				G2
W3				G3
W4				
W5				
W6				
W7				
W8				
W9				
W10				

GASKETS

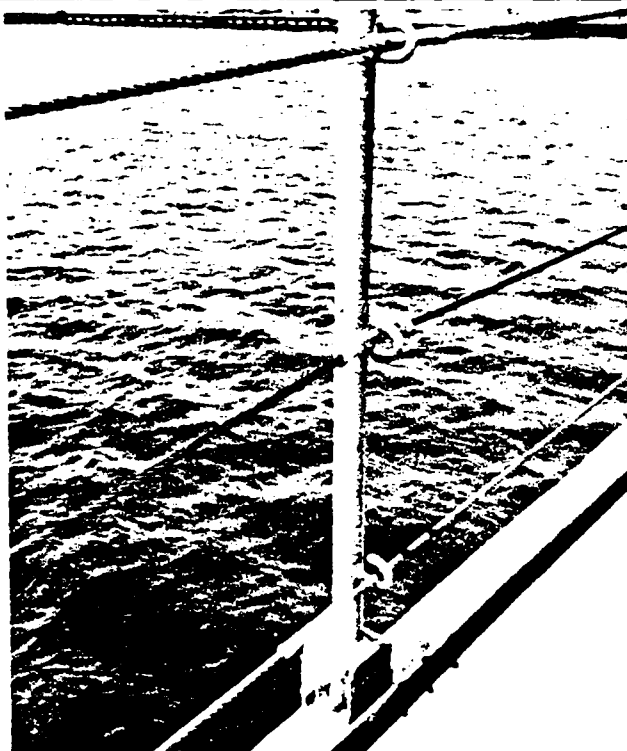
	MATERIAL
G1	
G2	
G3	

COMPONENT

	MATERIAL
M1	STEEL
M2	STEEL
M3	
M4	
M5	

QUANTITY PER SHIP:

32



TECHNICAL DATA SHEET

SHIP CLASS: FF1052 COMPONENT: STANCHION WITH BRACE

FASTENERS					NAVSEA CC SYSTEMS	
	DIAM	LNTH	QTY	MATERIAL		
F1	5/8	6	3	316 TOGGLE PIN	1. WSA (HT)	
F2	1/2	2	2	316 TOGGLE PIN	2. WSA (LT)	X
F3					3. TOPCOATS	
F4					4. POWDERED COATINGS	
F5					5. NON - SKID DECK COATINGS	
F6					6. CERAMIC COATINGS	
F7					7. WATER DISPLACING COMPOUND	
F8					8. ANTI - SEIZE COMPOUND	
F9					9. IMPROVED FASTENERS	X
F10					10. SEALING & COATING COMPOUND	
WASHERS				GASKETS	11. POLYSULFIDE SEALANT	X
					12. PROTECTION OF ELEC. CONN.	
	DIAM	QTY	MAT'L	MATERIAL	13. DIELECTRIC BARRIER (ABS)	
W1				G1	14. VAPOR PHASE INHIBITOR (VPI)	
W2				G2	15. STRIPPABLE COATINGS	
W3				G3		
W4				QUANTITY PER SHIP:		
W5						
W6				10		
W7						
W8						
W9						
W10						
COMPONENT						
MATERIAL						
M1 STEEL						
M2 STEEL						
M3						
M4						
M5						



A6-2-46

APPENDIX A8-1

INSPECTION REPORTS of USS ALBERT DAVID, USS BERKELEY, USS COPPELAND USS FLETCHER, USS FRESNO and USS TRUXTUN

1.0 INTRODUCTION

In order to evaluate the success of the CC preservation systems applied by the Pilot CC Shop, ISA conducted post-availability inspections of the six ships that received full CC packages. These inspections were valuable in evaluating processing problems and corrosion-prone areas of components.

2.0 METHODOLOGY

2.1 Preparation

Prior to boarding the ships, all WSA Production-Control Records and ESP-application-contractor invoices were collected and each component was listed on an inspection sheet (see Figure A8-1-1 as an example). All available information for each component, such as location or size, was also listed to aid in identification.

2.2 Equipment

Equipment required for each inspection was:

- 35mm camera with color print film
- Magnetic Thickness Gauge
- Eddy-current Meter
- 10x Magnifying Glass
- Magnet
- Knife

2.3 Inspection

The inspection crew notified each ship prior to the post-availability inspection. The inspectors were able to move freely around the ship without escorts which allowed them to progress at their own pace.

The inspection included:

- Visual evaluation of coating performance (i.e., blisters, cracks, pinholes, rust/oxidation from substrate, cuts/damage and S/F maintenance/repair actions).

- Visual evaluation of the installation and use of the "installation kits" for the ships to which they were issued (i.e., proper use of insulators and gaskets, 316-SS fasteners; ceramic-coated fasteners, separation of dissimilar metals and degree of degradation in dissimilar metal contact areas).
- Estimate of the probable cause of the degradation/failure and the accomplished or recommended fix.
- Physical measurement of degraded area included:
 - .. location and area of exposed substrate and/or inter-layer coatings, and
 - .. coating thickness(es).
- Color photography of selected items and the corrosion issues.

Copies of the inspection sheets are provided in Figures A8-1-1 through A8-1-6.

3.0 SUMMARY

The inspection of preserved components was performed to evaluate problem areas in the application and maintenance of the coatings. Color photographs of all inspected items were corrected problems and causes were evaluated and solutions were recommended.

**CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS ALBERT DAVID DATE 26 Apr 85

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
DOCK, VENT-WATERIGHT	1-43-1	✓			✓	THIN COATING, CLEAN AND APPLY 2 COATS 950	
"	1-43-2	✓			✓	"	
LADDER STATION	1-84-2	✓			✓	NONE	
"	"	✓			✓	"	
"	"	✓			✓	"	
"	"	✓			✓	"	
"	"	✓			✓	"	
"	"	✓			✓	"	
"	"	✓			✓	"	
"	"	✓			✓	"	
ACCUMULATION LADDER W/SHORE	1-93-2	✓			✓	"	
HAUSE PIPE COVER	FORECASTLE	✓		✓		PIN HOLE RUST, CLEAN AND PAINT IAW NAVSEA CC SYSTEM 3	
VENT SCREEN	1-127-1	✓		✓		RUST.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by _____ CC Shop Master _____ Signature _____ Date _____

Figure A8-1-1 Inspection Report - USS ALBERT DAVID

CORROSION CONTROL SHOP							
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET							
USS ALBERT DAVID				DATE 26 APR 85			
ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
VENTILATION	1-126-1	✓			✓	Repl. Replace or Patch	
"	1-124-1	✓			✓	CONVULSION OF FRAM, Replace or Repl.	
"	1-118-1	✓			✓	"	
"	1-119-1	✓			✓	"	
"	1-56-3	✓			✓	CONVULSION OF FRAME Replace or Repl.	
"	1-54-3	✓			✓	"	
"	1-80-3	✓			✓	"	
"	1-50-2	✓			✓	"	
"	1-56-3	✓			✓	"	
"	1-55-3	✓			✓	"	
"	1-54-3	✓			✓	"	
"	1-62-2	✓			✓	"	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ CC Shop Number: _____ Signature: _____ Date: _____

Figure A8-1-1 Inspection Report - USS ALBERT DAVID (Cont'd)

**CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS ALBERT DAVID DATE 26 Apr 85

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
VENTILATOR	1-73-2	✓		✓		Rust. Replace or Redo-	
"	1-80-2	✓		✓		"	
"	1-126-2	✓			✓	Good Condition.	
"	1-124-2	✓		✓		Rust. Replace or Redo-	
"	1-120-2	✓		✓		"	
"	1-118-2	✓		✓		"	
Line Reel		✓			✓	Good Condition	
Line Reel		✓			✓	Good Condition	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ CC Shop Station: _____ Signature: _____ Date: _____

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS BERKELEY (DDG-15) DATE 22 April 85

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
WT Door	03-126-0	✓			✓		
Director Compartment	04-130-2	✓			✓		
Director Compartment	03-140-0	✓			✓		
Searchlight	03-85-2	✓			✓		
Searchlight	03-60-2	✓			✓		
Searchlight	03-52-0	✓			✓		
Searchlight	03-10-1	✓			✓		
Searchlight Filters	03-69-1	✓		✓		Rust at seams. Redo	✓
Searchlight	03-85-1	✓			✓		
WT Door	02-135-2	✓			✓	t-15mils. S/Apply TT-E-490	
50 Cal Gun Mount	01-135-2	✓			✓	t-12mils. S/Apply TT-E-490.	
50 Cal Shield	01-135-2		✓		✓	t-15mils. O/L fasteners installed. Issue 3000 fasteners.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by Marie Robinson CC Shop Master Signature Date

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS BERKELEY (DDG-15) DATE _____

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
01-140-0			✓		✓	1/2" of steel welders in bilged, leave exposed. t=12 mils. S/F Paint.	
01-141-5-1		✓			✓	S/F Paint. t=2 mils.	
01-165-2		✓			✓	t=13-15 mils. S/F Paint.	
01-180-			✓		✓	Od fasteners used. Replace. t=14-16 mils. S/F Paint.	
01-140-1		✓			✓	t=12 mils.	
01-135-1		✓			✓		
01-125-1		✓		✓		Abused. S/F roughen & paint. t=6-12 mils. Topcoat entire shield.	
01-123-1		✓			✓	t=14 mils. S/F Paint.	
01-50-0			✓	✓		Weld at hinges & door. Patch & replace hinges with 316SS hinges.	
01-85-2		✓		✓		Running fast from under/asth steel plate. t=9 mils. Seal plate/door junction. Thru work at hinges & door. Patch weld. 316SS hinges.	
01-110-0			✓	✓			
01-88-1		✓			✓	t=12-15 mils. S/F apply paint.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by Marie Robinson CC Shop Master Signature Date _____

Figure A8-1-2 Inspection Report - USS BERKELEY (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

DATE 23 April 85

USS BERKELEY (DDG-15)

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
WT Door	01-85-1	✓			✓	t=15 mils. S/F paint.	
Vent Screen (2)	1-165-2	✓		✓		Rust! Redo	
WT Door	1-165-2	✓			✓	t=17 mils	
Phone Box	1-167-2	✓			✓	t=14 mils.	
Vent Screen	1-178-2		✓	✓		Rust. No nylon washers, Redo t=1500 washers. t=4 mils.	
Mar. 11 Tack Hstd.	1-195-2	✓		✓		t=9-12 mils. Minor chips from normal use. S/F paint	
Scuttle	1-195-2	✓			✓	t=14 mils S/F paint.	
Uncl. gr. Stiff Assy	1-210-0		✓	✓		Fasteners not available. Adhesion at fasteners grossly defective to normal service.	
Captain Controller	1-205-1		✓	✓		Non 316SS fasteners. Rust at seams. Redo.	
Phone Box	1-167-1	✓			✓		
WT Door	1-163-1	✓			✓	t=10-15 mils. S/F apply paint. F150 visible at wash access from normal use.	
Vit Screen	1-150-1	✓		✓		t=4.5-10. Rust. Redo.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by Marie Robinson

CC Shop Master

Signature

Date

Figure A8-1-2 Inspection Report - USS BERKELEY (Cont'd)

SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET
CONROSION CONTROL SHOP

DATE 23 April 85

USS BERKELEY (DDG-15)

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
WT Door	1-70-2	✓			✓	t=15-16 mils.	
Vent Screen	1-85-2	✓			✓	Painted by S/F.	
WT Door	1-110-2	✓			✓	t=15-16 mils.	
Vent Screens (3)	1-110-2	✓		✓		Rust bleeding through. Reco.	
WT Door	1-135-2	✓			✓	t=12 mils. S/F paint.	
Line Rack (2)	1-120-1	✓			✓	t=13-17 mils.	
WT Door	1-115-1	✓			✓	t=9-12 mils. S/F paint.	
House Pipe Covers (2)	1-5-0		✓		✓	Exteriors not noted crack susceptibility t=17-18 mils.	
Turtleback	1-10-1	✓			✓	t=16 mils.	
Rear Deck Hatch	1-38-2	✓			✓	t=15 mils S/F paint.	
Horn Box	1-45-2	✓		✓		ABUSED	
WT Door	1-50-2	✓			✓	t=15 mils. S/F paint	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Ernie Robinson

CC Shop Master

Signature

Date

Figure A8-1-2 Inspection Report - USS BERKELEY (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

DATE 23 April 85

USS BERKELEY (DDG-15)

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
Vent Screen (3)	1-60-2	✓		✓		Minor chips from aerial sec. S/F touch-up. t=14 mils. S/F paint.	
WT Door	1-65-2	✓			✓		
WT Door	1-62-1	✓		✓		t=12 mils. Rust at abrasion sites. S/F touch-up & paint	
V1 Screen (4)	1-58-1	✓		✓		Rust. Redo.	
WT Door	1-50-1	✓			✓	t=12 mils. S/F paint	
WT Door	1-48-1	✓			✓	t=13 mils. S/F paint	
Phone Box	1-45-1	✓			✓		
Fog Applicators (2)	1-45-0	✓		✓		Minor chips. No corrosion. S/F touch-up.	
Portable Davit	1-40-1	✓		✓		Abused. S/F touch-up & paint. t=15 mils.	
Raised Deck Hatch	1-18-1	✓			✓	t=17 mils.	
Scuttle	1-18-1	✓			✓	Shop did not mask ID plate. Reiterate masking procedures.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mervin Robinson

CC Shop Master

Signature

Date

Figure A8-1-2 Inspection Report - USS BERKELEY (Cont'd)

**CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

DATE 14 AUGUST 1985

USS COPELAND

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
LIGHT, OVER - HEAD FLOOD	02-330- 1	✓		✓		RUNNING, RUST STARTING FROM HOOD HINGES DESIGN INDUCED	CLEAN AND PAINT
"	02-330- 1	✓		✓		"	"
"	02-330- 1	✓		✓		"	"
"	02-330- 2	✓		✓		"	"
"	02-330- 2	✓		✓		"	"
"	02-330- 2	✓		✓		"	"
"	02-330- 3	✓		✓		"	"
"	02-330- 3	✓		✓		"	"
"	02-330- 3	✓		✓		"	"
"	02-330- 4	✓		✓		"	"
"	02-330- 4	✓		✓		"	"
"	02-330- 4	✓		✓		"	"

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature]

CC Shop Master

Signature

Date

Figure A8-1-3 Inspection Report - USS COPELAND

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

DATE 14 AUGUST 1985

USS COPELAND

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
LIGHT, OVERHEAD FLOOD	02-100-1	✓		✓		RUNNING, RUSTING, FROM HOOD HINGES DESIGN INDUCED	CLEAN AND PAINT
"	02-100-2	✓		✓		"	"
"	02-100-3	✓		✓		"	"
"	02-100-4	✓		✓		"	"
"	02-230-1	✓		✓		"	"
"	02-230-2	✓		✓		"	"
"	01-185-2	✓		✓		"	"
"	01-210-2	✓		✓		"	"
"	1-230-2	✓		✓		"	"
"	1-240-2	✓		✓		"	"
"	1-134-1		✓	✓		REQUIRES NYLON WASHERS, WORE COATING IS FAILING	REQUIRE WASH AND INSTALL PROPERLY
SWIVEL, FAS	02-130-1	✓			✓	NONE	NONE

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by

[Signature]

CC Shop Master

Signature

Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS COPELAND DATE 14 AUGUST 1985

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
SWIVEL, FAS	02-130-2	✓			✓	NONE	NONE
"	02-308-1	✓			✓	"	"
"	02-308-2	✓			✓	"	"
TRIPD, 50 CAL	1-170-1	✓		✓		WEAR AND TEAR CHIPPING	PAINT
"	1-170-2	✓			✓	NONE	NONE
"		✓			✓	"	"
"	02-308-2	✓			✓	"	"
WRENCH, ANCHOR	1-35-1	✓		✓		WEAR AND TEAR PAINT CHIPPING	PAINT
PYRO LOCKER AND SUNSHIELDS	02-120-1	✓		✓		PIN HOLE IN COATINGS	REPAINT
"	02-125-1	✓		✓		"	"
"	02-245-1	✓		✓		"	"
"	1-200-1	✓			✓	NONE	NONE

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature] CC Shop Master: [Signature] Date:

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS COPELAND

DATE 14 AUGUST 1985

ITEM	LOCATION	CORRECT		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
PIPE LOCKER AND SUBFIELDS	1-200-2	✓			✓	NONE	NONE
"	1-410-2	✓			✓	"	"
GIGALYCE MOUNTS	02-200-1	✓			✓	"	"
"	02-200-1	✓			✓	"	"
REEL, SWIMMER'S SAFETY	1-300-1	✓			✓	"	"
"	1-90-2	✓			✓	"	"
SCREEN, BULLNOSE	1-1-0		✓	✓		NEED REMOVED FASTENERS, WELD AND TACK	INSTALL IR AND PAINT
SCREEN, MWDB	01-185-2		✓	✓		"	"
SCREEN, BOAT CABIN	01-135-2		✓	✓		"	"
SPLASHER, G.M.C.	02-160-0	✓			✓	NONE	NONE
SUPPORT, BRIDGE	02-102-2		✓		✓	NEED PROPER FASTENERS	INSTALL IR
WING, CHAIR	1-35-1		✓	✓		NEED PROPER FASTENERS, WELD AND TACK PAINT COUPLING	INSTALL IR PAINT

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the SNp CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature]

CC Shop Master

Signature

Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS COPELAND DATE 14 AUGUST 1985

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
HATCH, RAISED NECK	1-33-2	✓			✓	PREVIOUS WSA COATING NOT COMPLETELY REMOVED, NO CORROSION OCCURRING	INSPECT FEB 86
HATCH, RAISED w/ SCUTTLE	1-10-2	✓			✓	"	"
HATCH, RAISED w/ SCUTTLE	1-402-2	✓			✓	"	"
CONTROLLER, CAPSTAN	1-35-1		✓	✓		SEAMS COATING FAILURE, NOT INSTALLED WITH PROPER FASTENERS	
CONTROLLER, CAPSTAN	1-400-0		✓	✓		"	
WALLET, WASTE OIL DRUM	1-231-1		✓		✓	NEED RUBBER GASKETS BETWEEN BRACKET AND DRUM	
"	1-245-1		✓		✓	"	
COVER, CHAIN LOCKER	1-32-1		✓	✓		REQUIRES PROPER FASTENERS, UNUSUAL WEAR AND TEAR, NO RUST	
COVER, HAUSE PIPE	1-20-1		✓	✓		"	
COVER, CHUCK	1-0-1		✓		✓	REQUIRES PROPER FASTENERS	
"	1-0-2		✓		✓	"	
"	1-18-1		✓		✓	"	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature] CC Shop Station Signature Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS COPELAND DATE 14 AUGUST 1985

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
COVER, CHECK	1-12-2		✓		✓	REQUIRES PROPER FASTENERS	
LIGHT, SIGNAL SEARCH	02-125-1	✓			✓	NONE	
"	02-125-2	✓			✓	"	
"	02-175-1	✓			✓	"	
"	02-175-2	✓			✓	"	
PHONE BOX	02-100-2		✓		✓	REQUIRES NYLON WASHERS, INSTALL PROPER TX	
"	02-100-1	✓			✓	NONE	
"	02-170-1	✓			✓	"	
"	02-170-2	✓			✓	"	
BRACKET, COMPRESSED BOTTLE RACK	1-110-2		✓		✓	REQUIRES RUBBER GASKET BETWEEN BOTTLE AND BRACKET	
"	1-112-2	✓			✓	NONE	
BRACKET ACCOMMODATION	1-250-1	✓		✓		NORMAL WEAR, PAINT	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by R. J. [Signature]

CC Shop Master

Signature

Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

DATE 14 AUGUST 1985

USS COPELAND

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
BULKHEAD ACCESS LADDER	1-240-1	✓		✓		NORMAL WEAR, PAINT	
BULKHEAD ACCESS LADDER	1-250-2	✓		✓		"	
BULKHEAD, COMPARTMENT BOTTLE	1-110-1		✓		✓	REQUIRES RUBBER GASKET IN WATER BOTTLE AND BRACKET	
"	1-112-1		✓		✓	"	
BOX, LIFE JACKET STORAGE	1-120-1		✓		✓	MISSING NYLON WASHERS, INSTALL PROPER IR	
"	1-105-1	✓			✓	NONE	
"	1-105-2	✓			✓	"	
"	1-125-1	✓			✓	"	
"	1-245-2	✓			✓	"	
"	1-245-2	✓			✓	"	
"	1-245-2	✓			✓	"	
"	1-245-2	✓			✓	"	
"	1-245-2	✓			✓	"	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been
 issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature]

CC Shop Master

Signature

Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP						
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET						
USS COPELAND				DATE 14 AUGUST 1985		
ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO	
B37 LIFE JACKET	1-245-2	✓			✓	NONE
"	1-105-2	✓			✓	"
"	1-205-2	✓			✓	"
HANDLE, FIRE	1-30-1	✓		✓		WEAR AND TEAR OF PAINT, RE-PAINT
"	1-30-2	✓		✓		"
"	1-170-1	✓		✓		"
"	1-170-2	✓		✓		"
"	1-330-2	✓		✓		"
"	02-125-2	✓		✓		"
"	02-285-1	✓		✓		"
B37X FLT ALLOY	1-240-2	✓		✓		NORMAL WEAR, PAINT
OUTRIGGER, STANCHION FOR ALLOY CLAMNET	1-240-2	✓		✓		"

The above items were inspected upon rehabilitation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature] CC Shop Master [Signature] Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

DATE 14 AUGUST 1985

USS COPELAND

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
COATINGS, STAINLESS STEEL, ALUMINUM, BRASS, COPPER, ZINC, GALVANNEAL	1-250-2	✓		✓		NORMAL WEAR, PAINT	
"	1-240-1	✓		✓		"	
"	1-250-1	✓		✓		"	
LIGHT COVERS, HELICOPTER DECK (15)	PANTALE	✓			✓	NONE	
LIGHT COVERS, DECK (12)	MAIN DECK	✓			✓	NONE	
BACKET, SCUPPER SURF	1-55-1	✓			✓	NONE	
"	1-55-2	✓			✓	"	
"	1-55-1	✓			✓	"	
"	1-85-2	✓			✓	"	
"	1-100-1	✓			✓	"	
"	1-100-2	✓			✓	"	
"	1-140-1	✓			✓	"	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: [Signature] CC Shop Master Date

Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

DATE 14 AUGUST 1935

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The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

29 Property

CC Shop Masters

Signature

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Figure A8-1-3 Inspection Report - USS COPELAND (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FLETCHER (DD-992) DATE 12 Sept 85

**COATING DAMAGE
CORRECT
INSTALLATION**

**COATING
THICKNESS**

ITEM	LOCATION	Y	N	Y	N	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
		E	O	E	O	S	S			
Web Deck Edge Light Covers (10)	1-517-0								PC was removed by S/F. Fasteners are varied and tapped.	T2-PC
		✓								
Flush Scuttle	1-506-2	✓		✓			25 21 15 225		Rust along lip, hinges, & fasteners. Alum oxide along handle. S/F painted top side.	Have S/F touch-up.
Raised Deck Hatch	1-494-2	✓			✓		11 16 17 14 14		Minor abrasion at hold- down bolts. S/F painted.	
Raised Deck Hatch	1-493-2	✓			✓		12 10 13 12		Alum oxide as grinding tab. Rust at hinges.	S/F touch-up.
Flush Hatch & Scuttle	1-506-1	✓			✓		16 13 15 17		Rust & alum oxide at hinges, fasteners, & edges. Alum oxide at handle. S/F painted.	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master Signature 1/19

Figure A8-1-4 Inspection Report - USS FLETCHER

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992)

DATE 12 Sept 85

CORROSION DAMAGE
COATING THICKNESS
COATING THICKNESS

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	W	S	A		
Flush Hatch	1-504-1	✓							Kind of alum oxide on lip, fastener hinges & handle. Chips of handle caused 1/2" area of rust. S/F painted top edge.	S/F touch-up.
Raised Deck Hatch	1-492-1	✓							Minor abrasion at top of door bolts & hinges. S/F painted top.	S/F touch-up.
Raised Deck Scuttle	1-493-1	✓							Kind of alum oxide on lip, fastener disposed of. Inside handle alum oxide.	S/F touch-up.
Overhead Floodlight & Bracket	1-470-1	✓							Flux inspection with wet sand washer on both sides of bracket. Rust at hinge. Bracket PC & painted.	S/F touch-up & include all 3/16" & bracket assembly with bracket washer.
Overhead Floodlight & Bracket	1-470-2	✓							Rust at hinge.	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 2/4

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992)

DATE 12 Oct 85

**CONTACT
INSTALLATION
COATING
DAMAGE**

**COATING
THICKNESS**

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
22ED box/GSS Can Cover / Base	1-467-2		✓		✓			10 11 11 8	Rivet at box base. Found badly burned. No gel. It vibrated. Below rivet. at hold down bolts. Box bottom had 2 coats of paint. No gel. It vibrated.	Install rivet - box/22-
Unrep Light	1-470-0		✓		✓			8 1/2 5 1/2 6 1/2	Run side at service of fasteners.	if touch-up.
Crusin Locker Cover	01-22-2	✓			✓			17 14 13	Minor abrasion at hold down bolts but no rust or delamination.	if touch up at rivet over fasteners.
Crusin Locker Cover	01-22-1	✓			✓			15 13	Same as port cover.	
House Pipe Cover	01-0-1	✓			✓			10 17 15	Minor rust at upper end of hold down bolts.	SF touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of
this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____

Shop Master _____

Signature

2/19

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FLETCHER (DD-992) DATE 12 Sept 85

ITEM	LOCATION	CORROSION				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	Y	N	WSA	WSP	ESP		
		YES	NO	YES	NO	PAINT	PAINT			
Hawse Pipe Cover	01-F-2	✓							Same as previous (O.U.)	
Unrep Light	01-250-1									
Vent Screen	01-28-1	✓							Rusty (95%) frame. Nylon washers not installed. Transverse structure.	Install new washers on side. Reinstall proper plate.
Unrep Light	01-260-1	✓						ESP PAINT 7	SP painted body. Rust from weld used where frame along side on vehicle edge.	SP touch up. Change section.
Vent Screen	1-750-1	✓							Rusty frame. Enclosed system assembly arranged.	Rebuild structure. Reinstall proper.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: W. J. Robinson Shop Master Signature 214

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992) DATE 12 Sept 85

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	Y	N	WSP	WSP	ESP		
Vent Screen	01-249-1	✓							Same as 01-250-1	
Fog Applicator	01-240-1	✓						10 13	Flare wraps, but no S/F touch up.	
Unrep Light	01-245-1	✓							Minor edge corrosion of alum.	S/F touch up.
Unrep Light	01-223-1	✓							Traced weld with 1/2 inches.	Install 1/2 inch flange as per spec.
Vent Screens (3)	01-210-1	✓						4	Flare on panels & welds after weathering not installed.	Re-P. Installed 2 1/2 inch flange as per spec.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master Signature 5/14

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992)

DATE 12 Sept 85

**CORROSION
DAMAGE**
**COATING
THICKNESS**

ITEM	LOCATION	CORROSION DAMAGE			COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	ESP	WSA	PAINT	ESP		
Unrep Light	1-198-1	✓						Alum oxide at weld. Nylon washer not integrated.	S/F touch-up.
FAS Swivel Arm Assembly	01-190-1	✓						Major chips are missing flashing steel.	
FAS Piping	01-185-1	✓						Fluct at 2002 valved handwheels. Flaking causing corrosion at threaded pipe.	S/F touch-up w/ wire filing.
Unrep Light	01-417-0	✓						Alum oxide at weld area. Nylon washer missing.	S/F touch-up.
Overhead Floodlight and Bracket		✓						Pinhole corrosion on weld. Fluct at hinge.	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mae Robinson

Shop Master Signature

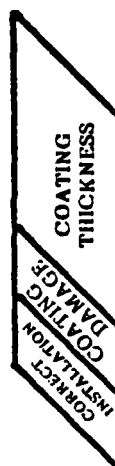
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Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-592)

DATE 12 Sept 85



ITEM	LOCATION	INSTALLATION				CORROSION DAMAGE			WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	S	Y	N	O			
Fg Applicator	01-410-2	✓				✓					rust at visible coupling due to chipping (24.3). Small chips along application.	S/F touch-up.
Vent Screens (4)	01-404-2	✓				✓					rust on vent screens omitted.	Change procedure.
FAS Piping	01-398-2	✓				✓				13 9	rust on vent screens. Rust on vent valves, trace of piping. No corrosion observed.	S/F touch-up. Grind to 316SS. Re-paint.
Unreplight	01-392-2	✓				✓				1/2 1/4 1 1/2	Crack holes existing due to CRCS screws. Cracks visible. Cracks visible. Cracks visible.	Change procedure. S/F touch-up.
FAS Swivel Arm Assembly	01-390-2	✓				✓				9 12 12	rust at armhole. Rust on armhole chip.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson

Shop Master Signature

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Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FLETCHER (DD-905) DATE 12 Sept 85

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	Y	N	E		
Unrep Light	01-386-2								Pinholes corrosion outside of shield	S/F touch-up
Pipe Brackets (6)	01-386-2								Combination of SS & mild steel fasteners	Change fasteners
Downed Floodlight & Bracket (F. 12)	01-416-1								Mixture of fasteners. Fast at hinge. Drainage pipe failure on shield.	Change fasteners. S/F touch-up.
FAS Piping	01-406-1								Fast at small valve. Some mild steel fasteners used. Corrosion 655 used.	S/F touch-up & change all 655 fasteners.
Vent Screens (4)	01-392-1								Used corrosion resistant material on shield painted by S/F.	Use PC.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mervin Robinson Shop Master Signature J/K

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992)

DATE 12 Sept 85

**CORROSION
DAMAGE
CORRECT
INSTALLATION**

**COATING
THICKNESS**

ITEM	LOCATION	YES	NO	YES	NO	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Unrep Light	01-382-1		✓					2 2	Unrep oxide on weld area. Rayon washers not in place.	E/F touch-up.
Water Hose Storage Box	02-292-1		✓					5.5 7.5 4.5 5.5	S/F painted; touch at handles under hinges (sestume used)	touch.
Water Hose Storage Box	02-292-1		✓				36.5 47.8 7.5 14.5 15.5	2 3/4	Pinhole rust. Rust down welds along welds. Found at bittings, handles, lid up. 1 hinge with missing ches hinges added.	touch PC.
Pyro Locker	03-2-2		✓				ESP+ PAINT 8.5 4.5		Original	touch PC.
Overhead Floodlight					✓		4	3 3 1/2	Pinhole corrosion on welded hinge of upper mounting	E/F touch-up light Radio light.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: M. J. Robinson

Shop Master
Signature

9/14

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FLETCHER (DD-992)

DATE 12 Sept 55

**CORROSION
DAMAGE
COATING
THICKNESS**

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Overhead Floodlight	03-3						12	1 1/2 3	Typical	redo
Overhead Floodlight	03-6						8 1/2		Typical	redo
Overhead Floodlight	03-7-4						10 13	1/2	Typical	redo
Overhead Floodlight (NO Shield)	03-7-2							6 1/2	Ypstr. rusting (CC)	redo bracket with WSA.
Pyro Lockers (4)	03-276-2 03-280-2 03-285-2 03-290-2						ESP Rem 12, 14 9, 13	6	SPF painted, holes as welded to CC. Found also: flat surface.	redo PC

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson

Shop Master

Signature

10/14

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FLETCHER (DD-882) DATE 12 SEP 85

**COATING DAMAGE
CORRECT
INSTALLATION**

**COATING
THICKNESS**

ITEM	LOCATION	YES	NO	YES	NO	WSA	WSA PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
(3) Signal Light Filters 04-140-0								9	fixed at vertical vacuum.	Re-PC
Craft Locker	04-168-1							6 8.5		
Fog Applicator	04-169-1							4 1/4 7 1/4 3 1/4	wood	
Fog Applicator	04-204-0							13 14 12	Scrapes but no rust. wood condition.	
Pyro Locker	04-200-0							9 9	wood condition.	
								5 1/2 6 3 1/2	typical	Re-PC

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master Signature 11/14

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992) DATE 12 Sept 95

ITEM	LOCATION	CORRECT				COATING DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	Y	N	E	O	WSA	WSA & PAINT	ESP		
Pyro Locker	04-226-1		✓									8 10 3½	typical	Re-PC
Pyro Locker	04-324-2		✓									10 5 4½	typical	Re-PC
Pyro Locker	04-332-2		✓									14	typical	Re-PC
Pyro Locker	04-338-2		✓									13 16 7	typical	Re-PC
Overhead Floodlight	04-346-5		✓									2 2½ 4	rust as previous things main pipe hole corrosion on shield	SF touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master Signature 12/14

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992)

DATE 12 Sept 95

ITEM	LOCATION	CORROSION DAMAGE					COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	Y	N	W	W	ESP		
		E	O	E	O	SA	SA			
		S	S	P	P	INT	INT			
Overhead Floodlight	04-346-3	✓		✓				13 9	Rust at hinges & fasteners leak through manhole corrosion on wheel.	S/F touch-up
Overhead Floodlight	04-346-1	✓		✓				13 13	Rust at fasteners & hinges manhole corrosion.	S/F touch-up.
Overhead Floodlight	04-346-2	✓		✓				13 15	"	S/F touch-up
Overhead Floodlight	04-346-4	✓		✓				13 12 1 1/2 1 1/2	"	S/F touch-up
Overhead Floodlight	04-346-6	✓		✓				14 9 1 1/2 1	"	S/F touch-up

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____

Shop Master _____

Signature _____

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Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLETCHER (DD-992) DATE 12 Sept 85

ITEM	LOCATION	CORROSION DAMAGE					COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	S	W	S	A		
Overhead Floodlight	04-3462	✓						9	2 1/2	Found at bottom of structure. Flare at base of structure. Flare at base of structure. Flare at base of structure.	S/F to be up
Overhead Floodlight	04-34610	✓						10	4	Found at bottom of structure. Flare at base of structure. Flare at base of structure. Flare at base of structure.	S/F to be up
Overhead Floodlight	04-34612	✓						10	3	Found at bottom of structure. Flare at base of structure. Flare at base of structure. Flare at base of structure.	"

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mervie Robinson Shop Master Signature 14/14

Figure A8-1-4 Inspection Report - USS FLETCHER (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1162)

DATE 9 Sept 85

COATING DAMAGE
INSTALLATION

COATING THICKNESS

ITEM	LOCATION	Y N E S				Y N E S				WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	Y	N	E	S					
Roller & Stopper	1-101-2	✓				✓					15,19, 10,10, 215,15 9,13		Wood. Scratched, 150 visible. Yarns, wear on pinholes in 1 dip, minor scratches on rollers	S/F touch up
Roller & Stopper	1-181-2	✓				✓					215,13 14,5 11,9 12,15		appears removed w/ piece. 1 x 2 piece. Abraded to one visible from cable	S/F touch-up
Roller & Stopper	1-168-2	✓				✓					15,16 15,11 15,9 15,11		edge abraded. Knots on bottom. Yarns worn abrasion to bare visible.	S/F touch-up
Roller & Stopper	1-160-2	✓				✓					10,12 19,14 13,12 10,10 13,14		flexible mat. Steel condition otherwise	S/F touch up
Stanchion	1-160-2	✓				✓					15,5,8 9,6,8 11,7,11		Yarns, 150 visible.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson

Shop Master Signature

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Figure A8-1-5 Inspection Report - USS FRESNO

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 6 SEP 85

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	Y	N	WSA	ESP		
Starbuck Insulation E15C	H10-2	✓				15, 12, 14, 10, 9, 8, 7, 10, 5, 3		Very thin 10 y. any. turning brown for top layer. Green base color. Small blue to yellow abrasion.	S/F touch up & topcoat.
Starbuck	I-103-2	✓				5, 10, 11, 7, 11, 11, 7, 8, 11, 10		Good at abrasion points for top layer. Some 150 visible at top.	S/F touch-up & topcoat.
Starbuck	I-104-2	✓				6, 7, 12, 8, 7, 11, 13, 10, 7, 12		Good at points of top layer abrasion. No for abrasion. (top layer).	S/F touch-up & topcoat.
Starbuck	I-156-2	✓				8, 19, 10, 4, 6, 10, 5, 10, 8, 6		Cracked on top. 150 highly visible. Cracks on at visible. Good under body for top.	S/F touch-up and topcoat.
Starbuck	I-155-2	✓				5, 1, 9, 5, 4, 10, 7, 8, 5, 5		Good at abrasion points at cracked area.	S/F touch-up & topcoat.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Travis Tolson Shop Master Signature 2/21

Figure AB-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 6 Sept 85

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS		ESP	OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	W	S			
Stanchion	1-178-1	✓				9	10,12,13		rust at ladyfingers.	S/F touch-up & local
Stanchion	1-154-1	✓				13	11,12,13		rust under lifeline hook on ladyfinger.	"
Stanchion		✓				10	5,12,13		rust. 1" from lifeline hook.	
Stanchion	1-65-2	✓				10	12,11,9		Alum oxide at ladyfingers. Scales in T.E. 480	S/F touch-up.
Stanchion	1-67-2	✓				7,5,12	11,12,13		Observed at ladyfingers but under new paint. 150	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master 3/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1132) DATE SEP 55

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	Y	N	WSP	WSP		
Starbchion	1-64-2	✓		✓		13,11,14 15,14 12,15	5	When 1100 WSP was done, 2 coats on upper body plating. When done at 1100.	S/F touch-up.
Starbchion	1-62-2	✓		✓		11,15,11 12,10,10 14,12	7	When 1100 WSP was done, 2 coats on upper body plating. When done at 1100.	S/F touch-up.
Starbchion	1-53-4	✓		✓		13 12,15,13 12,15,10 14,12,12	13	When 1100 WSP was done, 2 coats on upper body plating. When done at 1100.	S/F touch-up.
Starbchion	1-53-2	✓		✓		11,14,9 14,11,15 12,12,14	9	When 1100 WSP was done, 2 coats on upper body plating. When done at 1100.	S/F touch-up.
Starbchion	1-52-4	✓		✓		10 12,15,9 12,15,13 13,12,10	10	When 1100 WSP was done, 2 coats on upper body plating. When done at 1100.	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: FRANCIS E. BROWN Shop Master Signature 4/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182)

DATE 9 Sept 85

ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	Y	N	ESP		
Swatchion	1-52-2	✓				✓		9 15, 13, 12 14, 14, 10 15, 14, 11	TT-E-490 worn by wipe.	S/F touch-up
Swatchion	1-52-0	✓					4	15, 12, 15 14, 14, 15 15, 13, 15	WSA worn at low grade.	S/F touch-up.
Stopper & Roller	1-168-1	✓						9 18, 6 9, 7, 10 11, 8, 13 15, 9, 12	Surface expected, but only in TT-E-490 finish on bottom edges.	S/F touch-up.
Stopper & Roller	1-168-1	✓				✓		13, 11, 6 14, 14 15, 15 8, 1, 13	Worn around steel bulk head runoff for large weld.	Change fastener.
Stopper & Roller	1-181-1	✓						12 10, 11, 15 12, 8, 10 13, 8, 6	Worn around edge. Varnish possible used on stopper. Bare metal at bottom of stopper.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson Shop Master Signature 5/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 25 APR 82

ITEM	LOCATION	COATING DAMAGE			COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	ESP	Y	N	ESP		
Stopper & Roller	1-220-1	✓					12, 11 10-15	Unable to remove from deck fitting. Minor rust. Speckled topcoat.	
Stopper & Roller	1-235-1	✓					7.5 10-15	Rust runoff. Minor rust at pinhole.	S/F touch-up.
Stopper & Roller	1-235-1	✓					12.5, 7.5 12, 10.5 7.5	Minor Hinder rust. Rust Runoff Stopper chipped & abraded at edge.	S/F touch-up
Stopper & Roller	1-235-2	✓					15, 12, 10, 17 8-10	Chipped to bare underlayment edge.	S/F touch-up.
Stopper & Roller	1-220-2	✓					11.5, 6.5 11.5, 9.5 10-15	Cable abrasion. Speckled topcoat. Chipped pinhole.	S/F touchup

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Steve FOLINGO Shop Master Signature 6/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182)

DATE 9 Sept 85

CORROSION
 DAMAGE
 COATING
 THICKNESS

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA PAINI	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Stopper & Roller	1-220-2	✓		✓			29,77 10,16		Cable Strission. 1504 WEA visible on wear area. Minor rust on bottom edges. Chip at pin hole.	S/F touchup
Stopper	1-181-1	✓			✓		92-25		Pinhole rust.	S/F touchup
Stanchion	1-231-2	✓			✓	4	68-12		Scraped	S/F touchup
Detank Handrail	1-135-1	✓			✓		6-13		Minor scraped. Rust at pinholes.	S/F touchup
Detank Handrail	1-135-1				✓		6-11		Minor scrapes. Rust.	S/F touchup

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of
 this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 7/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182)

DATE 11 Sept 85

ITEM	LOCATION	COATING DAMAGE				COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	Y	N	E		
		S	S	S	S	SA	SA	SA		
Debar k Handrail	1-135-1	✓			✓				Minor scrapes.	S/F touch up.
Debar k Handrail	1-135-1	✓			✓				Minor scrapes. Wear.	S/F touch up.
Debar k Handrail	1-135-1	✓			✓				Minor scrapes. Paint wearing	S/F touch up.
Debar k Handrail	1-135-1	✓			✓				Scraped.	S/F touch up.
Debar k Handrail	1-135-1	✓			✓				Scraped.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature B/L

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FREEDOM DATE 11 OCT 85

CORROSION DAMAGE
COATING THICKNESS

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Debar k Handrail	1-135-1	✓		✓			9-14		Seal. rep.	S/F touch up.
Debar k Handrail	1-135-1	✓		✓			7-15		Minor wear rep.	S/F touch up.
Portable Chest		✓		✓			5-15		Chipped & abraded. 150 microns. Fluct at horizon & surge.	S/F touch up.
Portable Chest		✓		✓			6-14		Minor abrasion with 120 microns. Minor fluct at closure body.	S/F touch up.
Portable Chest	1-20-2				✓				Minor wear. Rust deposits on paint from splashing water.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 9/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 11 SEP 88

ITEM	LOCATION	COATING DAMAGE					COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	S	W	S		
Portable Chest	1-20-2					✓		8-76	rusting welds on threads - finish head	
Portable Chest	1-20-2					✓		7-15	Bottom scraped to WSA	
Deck Handrail	1-53-2					✓	8	10-15	Scraped to WSA. Abrasion at pinholes.	
Deck Handrail	1-53-2					✓		42-11	Scraped to WSA. Rust at pinholes.	
Deck Handrail	1-53-2					✓		5-13	Scraped to WSA. Rust at pinholes.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 10/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FRESNO (LST-1182) DATE 11 Sept 85

CORRECT INSTALLATION										COATING DAMAGE		COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
ITEM	LOCATION	Y	N	E	S	Y	N	W	S	WSA & PAINT	ESP				
Debarb Handrail	1-53-2				✓					5-13		Minor wear.	S/F touch up.		
Debarb Handrail	1-53-2				✓					8-12		Large chip on top. (1 in x 3 in). Scuffed.	S/F touch up.		
Debarb Handrail	1-53-2				✓					5-12		Scuffed.	S/F touch up.		
Star chion	1-53-2				✓					8-9 1/2		Bottom LF abraded. Substrate rusting. Vaguel pin rusting. 150 micron in top cap.	S/F touch up.		
Star chion	1-228-2				✓					4		Weld on LF. Rust on 2 off body frame.	S/F touch up.		

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 11/51

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182)

DATE 6 Sept 95

COATING DAMAGE
COATING THICKNESS
CONDUCTIVITY

ITEM	LOCATION	Y N E S			WSA	WPAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S				
Starbion EVERONE						7	8-11	Abrasion at bottom of hull steel pitting. Puffing back.	S/F touch up.
Temporary Safety Starbion	1-234-3						7-12	Coating loss at bottom 150 inches. Complete wind coverage inside	S/F touch up.
Temp. Safety Starbion	1-234-1						4-9	S/F painted. Minor chipping at bottom.	S/F touch up.
Temp. Safety Starbion	1-234-2						9-15	Scraped hull at bottom abrasion area 150 inches	S/F touch up.
Temp. Safety Starbion	1-234-4					6 1/2	9-13	Scraped hull at bottom due to abrasion. 150 inches.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 12/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 6 Sept 65

CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

ITEM	LOCATION	CORROSION CONTROL SHOP			COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	ESP	WSA	ESP		
Crew Locker Cover	1-22-1	✓	✓		7-15 int 4-10		Hand sandblasted clean. Alumin. oxide applied in floor around base.	S/F touch up
Manhole Pipe Cover	1-18-1	✓	✓		7-13		Alumin. oxide under hold down bolts. 150 micron sand on expended metal & stiffen.	S/F touch up
Stanchion	1-23-1-4	✓	✓		9-15		Corrosion at base	S/F touch up
Stanchion	1-18-2	✓	✓		5-11		150 micron. Sagger riveting at base on lathings.	S/F touch up
Stanchion	1-18-2	✓	✓		6-4		Spalled paint. Corrosion at base on lathings.	S/F touch up

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 12/1

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FRESNO (LST-1182) DATE 15 Sep 65

ITEM	LOCATION	CORROSION INSTALLATION				COATING DAMAGE		COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	Y	N	WSA	WSA & PAINT		
Stanchion	1-180-2					✓			3-15	Good under lap due to 150 visible. S/F paint at bottom.	S/F touch up.
Stanchion	1-69-1					✓			3-15	Good at ladders. Aluminum oxide. Rust at porthole.	S/F touch up.
Stanchion	1-64-1					✓			3-15	Good to bare metal at ladders. Aluminum oxide at porthole.	S/F touch up.
Stanchion	1-172-2							✓	7 9-15	Badly rusted. WSA & 150 visible. No rust.	S/F touch up.
Stanchion	1-172-2								14-15	Good at top lap due to abuse.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 14/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FLEND (CT-1182) DATE 11 Sept 85

CORROSION CONTROL SHOP
COATING DAMAGE
COATING THICKNESS

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Deck Hardie	1-B5-1		✓				7-14		minor scuffs.	S/F touch up.
Deck Hardie	1-53-2		✓				6-10		Scuffed & worn	S/F touch up.
Deck Hardie	1-53-2		✓				6-14		minor chips & scuffs.	S/F touch up.
Deck Hardie	1-53-2		✓				8-13		Scuffed & worn. Abrasion at joints.	S/F touch up.
Deck Hardie	1-53-2		✓				10-15		minor scuffs.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 15/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FRESNO (LST-1182) DATE 11 Sept 85

COATING THICKNESS									
ITEM	LOCATION	CORROSION DAMAGE				COATING THICKNESS			
		Y	N	E	O	W	S	A	ESP
		Y	N <td>E</td> <td>O<td>W<td>S<td>A<td>ESP</td></td></td></td></td>	E	O <td>W<td>S<td>A<td>ESP</td></td></td></td>	W <td>S<td>A<td>ESP</td></td></td>	S <td>A<td>ESP</td></td>	A <td>ESP</td>	ESP
Stanchion	1-172-2				✓			9-15	
Stanchion	1-172-2				✓			4-11	
Stanchion	1-172-2				✓			13-15	
Stanchion	1-172-2				✓			8-14	
Stanchion	1-172-2				✓			10-15	

ITEM	LOCATION	Y	N	E	O	W	S	A	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Stanchion	1-172-2				✓			9-15		Alum oxide at port hole main vacapac. Shrivelled top hole riveting inside.	S/F touch up.
Stanchion	1-172-2				✓			4-11		rusting in holes and at 1 vacapac. 150 blaster.	S/F touch up.
Stanchion	1-172-2				✓			13-15		main vacapac.	S/F touch up.
Stanchion	1-172-2				✓			8-14		Sealed along 1 side. 150 blaster.	S/F touch up.
Stanchion	1-172-2				✓			10-15		Level of alum oxide at port hole S/F-paint but at bottom	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mervie Robinson Shop Master 16/2
Signature

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 11 Sept 85

ITEM	LOCATION	CORROSION CONTROL					COATING DAMAGE		COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	O	S	Y	N	W	S		
Starbion	1-172-2										S/F paint at bottom - marion scrapes	S/F touch-up.
Starbion	1-172-2										Scrapes to 150 WSA.	S/F touch-up.
Starbion	1-172-2										blended & misting.	S/F touch-up.
Starbion	1-172-2										Scrapes. Greasy.	S/F clean & touch-up.
Starbion	1-173-2										chip on top - Alum oxide.	S/F touch-up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 17/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRESNO (LST-1182) DATE 11 Sept 85

COATING DAMAGE
COATING THICKNESS
COATING INSTALLATION

ITEM	LOCATION	Y E S	N O	Y E S	N O	WSA	WSA & PAINT	ESP	OBSERVED CONDITION	RECOMMENDATIONS
Stanchion	1-173-2						11-15		Strip. Scrape to substrate. 150 visible	S/F touch up.
Stanchion Support							6-15		Scrape to 150. Rust at pinholes.	S/F touch up
Stanchion Support	1-151-1						9-15		Alum & zinc oxide at bottom. 150 visible. Scrape to 150, WSA & substrate.	S/F touch up.
Stanchion	1-134-3						8-15		150 visible. Rust at pinholes. Minor scrape to 150	S/F touch up.
Stanchion	1-134-1						8-15		150 visible. Rust at pinholes. Scrape to V.A.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 10/21

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP **SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS FRENO (LST-1182) DATE 11 SEP 55

CORRECT INSTALLATION										COATING DAMAGE			COATING THICKNESS			OBSERVED CONDITION	RECOMMENDATIONS	
ITEM	LOCATION	Y	N	E	O	S	Y	N	O	W	S	A	W	S	A			ESP
Starction	1-173-2								✓					9-14			1 except to 150.	S/F touch up.
Starction	1-52-1								✓					11-715			S/F painted. Abrasion to WSA & base unmet.	S/F touch up.
Starction	1-62-1								✓					8-715			Minor wear at lap/join	S/F touch up.
Starction	1-67-1								✓					4-13			Rust at lap. Under lap wear at all. 150 will be at lap.	S/F touch up.
Starction	1-88-2								✓					6-8			Splices in 490. Alum oxide at pinholes.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature 19/51

Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FRESNO (LST-1182) DATE 9 Sept 85

ITEM	LOCATION	CORRECT INSTALLATION				COATING DAMAGE		WSP	WSP	WSP	WSP	OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	Y	N						
Stanchion	1-87-2											Spalling in 490 th area Alum oxide at portholes	Refinish
Stanchion	1-87-2											"	"
Stanchion	1-86-2											"	"
Stanchion	1-86-2											Yarrow chips. Alum oxide at portholes	"
Stanchion	1-85-2											Spalling in 490. Alum oxide at portholes	"

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 29/21

Figure A8-1-5 Inspection Report ~ USS FRESNO (Cont'd)

CORROSION CONTROL SHOP SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS FRESNO (LST-1132)

DATE 11 SEP 85

ITEM	LOCATION	CORRECT INSTALLATION				COATING DAMAGE		COATING THICKNESS		OBSERVED CONDITION	RECOMMENDATIONS
		Y	N	E	S	Y	N	WSA	WSA & PAIN		
Fairlead Rod	Tank Deck								9-215	Y Surface pitted & rusted.	IF touch up.
Fairlead Rod	"								9-215	Y Surface rusted & pitted.	S/F touch up.

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: _____ Shop Master _____ Signature _____ 21/21

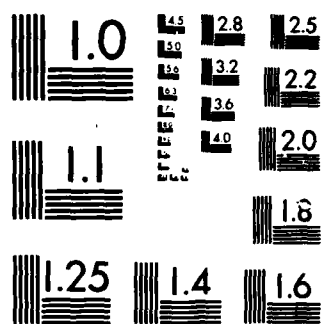
Figure A8-1-5 Inspection Report - USS FRESNO (Cont'd)

AD-A163 671 CORROSION-CONTROL (CC) PROGRAM SIMA (SHORE INTERMEDIATE 5/5
MAINTENANCE ACTIV. (U) INTEGRATED SYSTEMS ANALYSTS INC
NATIONAL CITY CA W ADKINS ET AL. 30 NOV 85
UNCLASSIFIED ISA(MC)-107-VOL-2 N66001-85-C-0350 F/G 11/6 NL

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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

**CORROSION CONTROL SHOP
SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET**

USS TRUXTUN (CGN-35) DATE 26 April 85

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
Nel Frame	Flight Deck-2		✓	✓		Pinhole rust. Mild rust for repair. weep hole rust. t=8-10 mils. Redo.	
Nel Frame	Flight Deck-2		✓	✓		Pinhole rust. t=7 mils. Redo.	
Nel Frame	Flight Deck-1		✓	✓		Pinhole rust. t=10 mils. Redo.	
Turtle back	Forecastle-2		✓	✓		Minor abrasion at 1-bolts. t=6 mils. Add paint & faster grouting.	
Turtle back	Forecastle-1		✓	✓		Minor abrasion at 1-bolts. t=4 mils. Add paint & correct for later repair.	
50 cal Gun Mount	O2-2	✓		✓		t=8-10 mils. Minor pinhole rust. Monitor.	
50 cal Gun Mount	O2-1	✓		✓		Pinhole rust. t=8-10.5. Redo.	
40mm Gun Mount	O2-1	✓		✓		Pinhole rust t=9 mils. Redo.	
40mm Gun Mount	O2-2	✓		✓		Pinhole rust. t=10-12 mils. Redo.	

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Mark E. Johnson CC Shop Monitor Signature _____ Date _____

Figure A8-1-6 Inspection Report - USS TRUXTUN

SHIPBOARD CC POST-AVAILABILITY INSPECTION SHEET

USS TRUXTON

DATE 15 Aug 85

ITEM	LOCATION	CORRECT INSTALLATION		COATING DAMAGE		DEFICIENCIES AND RECOMMENDATIONS	CORRECTIVE ACTION TAKEN
		YES	NO	YES	NO		
Turtleback	Forecastle-2		✓		✓	Mild steel bolts used in structure.	
Turtleback	Forecastle-1		✓		✓	Normal abrasion at fastener areas due to omission of grinding washers.	
						Total coating thicknesses 4.5-10 mils.	
						No visible corrosion products.	
						Add add'l painted correct fasteners.	
P-250 Box + Gas Cover	Forecastle-0	✓		✓		Minor edge chipping due to normal service. Roughen & paint areas.	
Compressor and Battle Racy	01-167-1		✓	✓		Pinhole rust. No inhibitor installed at mounts. Redo.	
P-250 Box + Gas Cover	01-149-1		✓		✓		
Helo Net Frame	Flight Deck - 1		✓	✓		Mild steel fasteners installed. Pinhole rust. Redo & issue correct fasteners.	
Helo Net Frame	Flight Deck - 1		✓	✓		Non-Bless fasteners installed. Pinhole rust. Redo & issue correct fasteners.	
P-250 Box + Gas Cover	01-149-2	✓		✓		Minor edge chipping due to normal service.	
P-250 Box + Gas Cover	Forecastle-0	✓		✓		Minor edge chipping due to normal service. Roughen & paint area.	
Saluting 40mm Gun Mount	02-1	✓			✓	If painted exterior. Pinhole rust interior in topcoat only.	
40mm Gun Handle	02-1	✓			✓		

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson

CC Ship Master

Signature

Date

Figure A8-1-6 Inspection Report - USS TRUXTON (Cont'd)

U.S. TROOPING (CGN-35) DATE 15 Aug 35

The above items were inspected upon reinstallation and found to be in the condition listed. A copy of this report has been issued to the Ship CC Coordinator in order to provide the corrective action recommended.

Prepared by: Marie Robinson

Figure A8-1-6 Inspection Report - USS TRUXTUN (Cont'd)

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